



# Data Visualizer

Version 3.1.0

Operation manual

English



6th edition

July 2021



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## 01 Introduction

This document describes the basic operations required to display and analyze data by using Visual M2M Data Visualizer (hereinafter called Data Visualizer).

## 02 Preparing the user environment

A server system must be prepared to use Data Visualizer with each new project.

Prepare a client personal computer (PC) with a browser installed.

The recommended environment is as follows.

	Recommended environment
OS	Windows, macOS
CPU	Intel 3rd Generation Core i5
Memory	At least 8 GB
Network	Internet network environment
Browser	Google Chrome (Latest version)

## 03 Tutorial

Tutorial videos on how to use the Data Visualizer are available.

To view the tutorial videos, click on the links listed at the bottom of the following page:

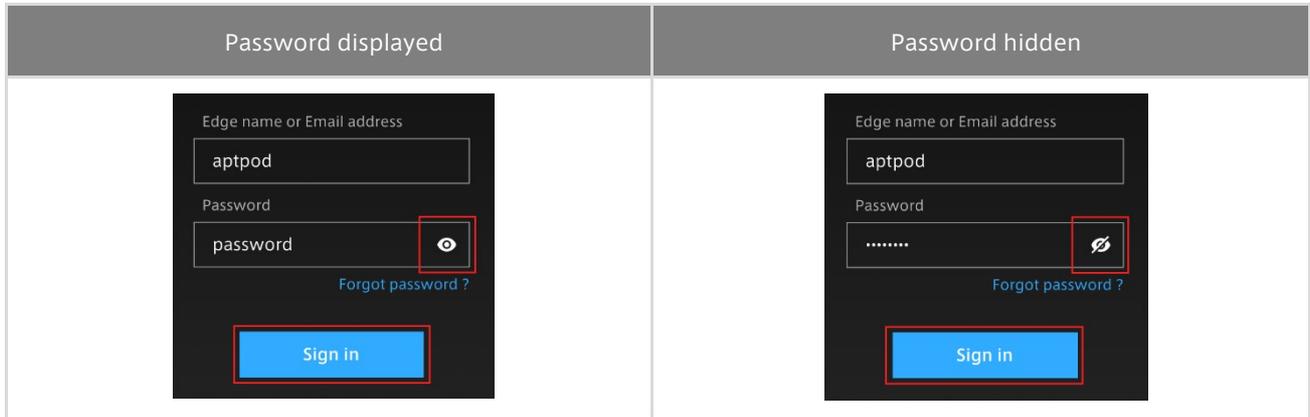
<https://www.aptpod.co.jp/products/data-visualization/> (available in Japanese only)

## 04 Signing in to the Data Visualizer site

You need to set a permanent password to replace the temporary password issued at the first sign-in.

Enter the user ID and password in [Edge name or Email address] and [Password] on the sign-in window, and then select [Sign in].

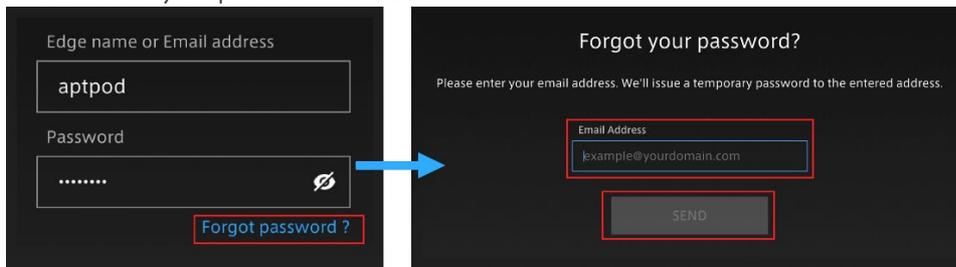
Selecting the  button will show or hide text entered in the password field.



### Point: If you forgot your password

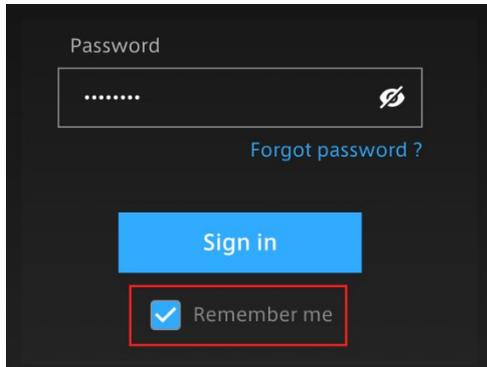
If you forgot your password, reset your password.

1. Select "Forgot password?" .
2. Enter the email address of your account in the [Email Address] field.
3. Select [SEND]. An email will be sent to your email address containing a link you can use to reset your password. You can reset your password from the link.



### Point: Automatic sign-in

Selecting [Remember me] allows automatic sign-in. In automatic sign-in mode, when you re-access the site within a certain period of time, you do not need to enter the user ID and password.



## 05 Structure of the Data Visualizer window

After sign-in, the following window will appear. The parts of the window are as follows.



### 1 Button to switch to full-screen display

	Full-screen button	Makes the browser full-screen. * Press the [ESC] key to cancel full-screen display.
--	--------------------	--

### 2 Data information

Displays the domain name, name of the screen being displayed, and data loading status.

The display is different between live measurement and past data playback.

Icon	Name	Overview	Display mode
	LIVE	Live measurement	Only live measurement
	Reload	Reloads the past data set in the screen.	Only past data playback
	Loading	Displays the collection status of past data.	Only past data playback

### 3 Playback control

The items are different between live measurement and past data playback.

### Display of live measurement



Icon	Name	Overview	Display mode
	Live Mode	Live measurement mode. Select this to switch the mode to past data playback.	Only live measurement
	Play	Starts playback of measurement data.	Common
	Pause	Pauses the playback of measurement data.	Common
	Stop	Stops the playback of measurement data.	Common

### Display of past data playback



Icon	Name	Overview
	Live Mode OFF	Past data playback mode. Select this to switch the mode to live measurement.
	Repeat	Replays measurement data repeatedly.
	Step Backwards/Forwards	Steps backward or forward (step length determined in "Show Forward" ). For details, see <a href="#">9.2 Cursor operation</a> .
	Speed	You can specify the playback speed.

## 4 Timeline Control

For details, see [11.4 Specifying the playback time range](#).

Icon	Name	Overview
	Preview Stored Data	You can specify the playback range of measurement data.
	Create a Capture	Registers the measurement data within a specified range in [Capture] in the content menu.

## 5 Panel operation tools

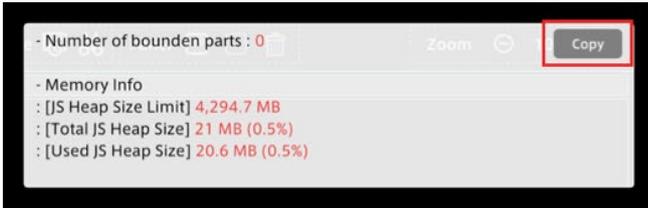
The display is different between live measurement and past data playback.

Icon	Name	Overview	Display mode
	Select All Panel	Selects all panels.	Common
	Select OFF Panel	Deselects panels.	Common
	Delete Panel	Deletes the selected panel.	Common
	Zoom in	Zooms in the screen panel.	Common
	Zoom Reset	Returns the screen panel to normal magnification.	Common
	Zoom Out	Zooms out the screen panel.	Common

## 6 Browser load status

Icon	Status	Description
	Normal	No issue
	Warning	Slight lag
	Critical	Lag

Selecting the icon will display information about the browser load status. Press [Copy] to copy the text of the displayed information.



## 7 Function menu

Icon	Name	Overview
	Screen Settings	Changes the screen settings.
	Timeline Settings	Changes the timeline settings.
	Panel Settings	Changes the panel settings.
	Data Settings	Changes the parse data settings. For details, see <a href="#">07 Parse data</a> .
	Data Download	Downloads measurement data.
	User settings	Use this function to confirm the signed-in user name, and to sign out.
	Config	Displays various links. You can check the version of Data Visualizer here.

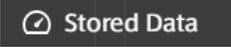
## 8 Timeline

This area shows the main measurement data for analysis and the time axis. For details, see [09 Timeline](#).

## 9 Screen panels

This area displays measurement data. In this area, the measurement data and edge are bound. For details, see [08 Data binding](#).

**10** Content menu

Icon	Name	Overview
	Stored Data	Displays a list of past measurement data. For details, see <a href="#">11 Playing back and capturing past measurement data</a> .
	Screen	Displays a list of screens. For details, see <a href="#">06 Screens</a> .
	Visual Parts	Use this function to select parts to be displayed on the screen panel.

**Point: Screen key shortcuts**

ESC key shortcuts: Unfocusing input, closing a pop-up message, closing a modal window

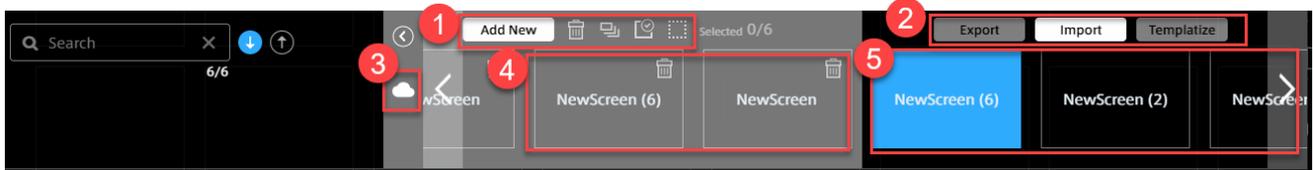
Shortcuts for opening/closing the content menu · s : Screen · d: Stored Data · v: Visual Parts

# 06 Screens

## 6.1 Screens and screen list

### Screen list

A list of screens is displayed. You can create, manage, and switch screens from the list.



#### 1 Operation menu for local screens

Setting	Description	Remarks
	Creates a new local screen.	For details, see <a href="#">6.4 Creating screens</a> .
	Deletes the selected local screen.	For details, see <a href="#">6.5 Deleting screens</a> .
	Copies the selected local screen.	
	Selects all the local screens.	
	Deselects the local screens.	

#### 2 Sharing function menu

[Templatize]: See [6.7 Sharing screen: Template](#).

[Export], [Import]: See [6.8 Sharing screen: Export, Import](#).

#### 3 Button to show/hide templates

#### 4 Template screens

For details, see [6.7 Sharing screen: Template](#).

#### 5 Local screens

For details, see [6.2 Displaying screens](#), [6.4 Creating screens](#).

## 6.2 Displaying screens

Click the screen selection button in the content menu, and then select one of the screens displayed in the local screen list.



## 6.3 Changing displayed screens

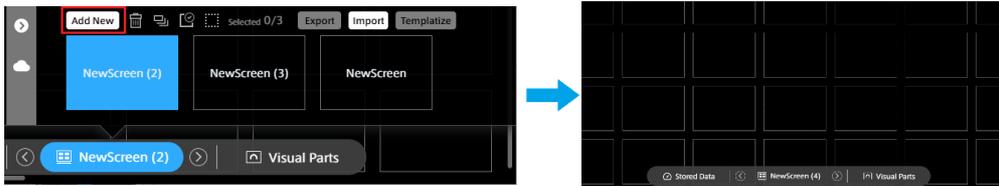
You can directly select a screen to be displayed as described in [6.2 Displaying screens](#).

You can also change the displayed screen to the previous or next screen by selecting the  and  buttons at both ends of the screen selection button.



## 6.4 Creating screens

Selecting the [Add New] button in the screen list will display a blank screen.



Place visual parts and data you want to use on the screen panel (data binding).

For details about how to bind data to screen panels, see [08 Data binding](#).

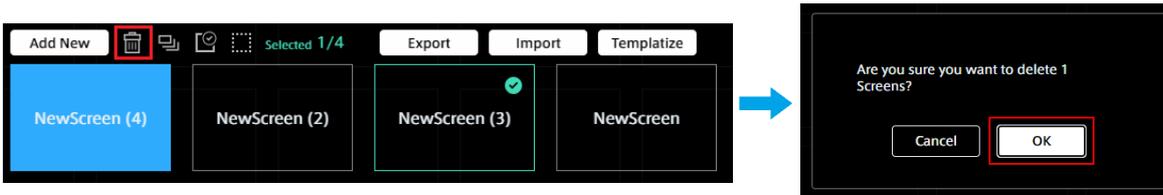
### Point

Local screens are managed for each client PC. When using another client PC, you need to create screens again. If you want to reuse screens, use the [templates](#), or the [export and import functions](#).

## 6.5 Deleting screens

Mouse over the screen to be deleted and select the displayed  button.

Select  and then click the [OK] button in the confirmation dialog box.



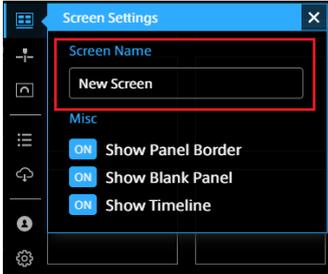
## 6.6 Changing the screen settings

You can change the settings of the displayed screen.

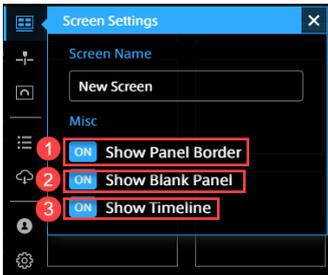
Select  (Screen Settings) from the function menu.

### Changing the screen name

Enter the desired name in the [Screen Name] text box.



### Changing the display of the screen panels

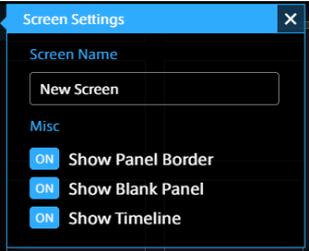
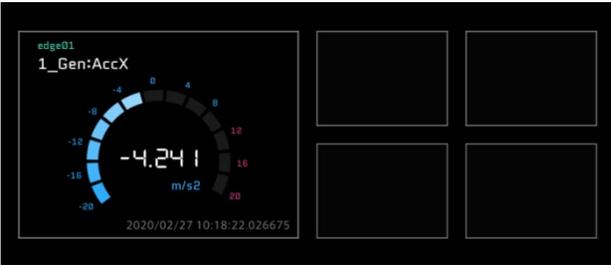
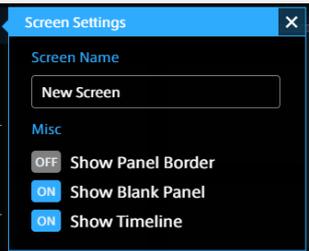


#### 1 Show Panel Border

Show or hide the panel border.

#### 2 Show Blank Panel

Show or hide blank panels.

Setting	Condition display	Panel display
	Show Panel Border: ON Show Blank Panel: ON	
	Show Panel Border: OFF Show Blank Panel: ON	

	<p>Show Panel Border: ON Show Blank Panel: OFF</p>	
	<p>Show Panel Border: OFF Show Blank Panel: OFF</p>	

### 3 Show Timeline

Show or hide the timeline.

Menu condition	Timeline display

## 6.7 Sharing screen: Template

### Screen

You need to create a screen to display measurement data.

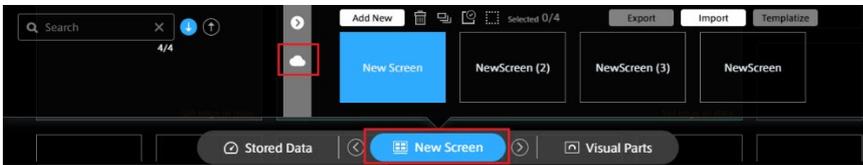
A screen means a single window that displays all the panels.



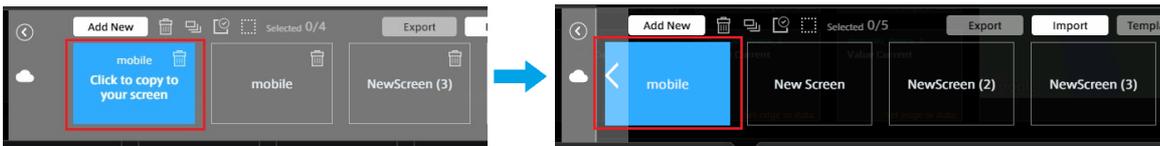
### Using templates

You can use screen templates managed by the server for each domain.

Click the screen selection button in the content menu and click .



Select a template you want to use. The template will be added to the end of the local screen list.

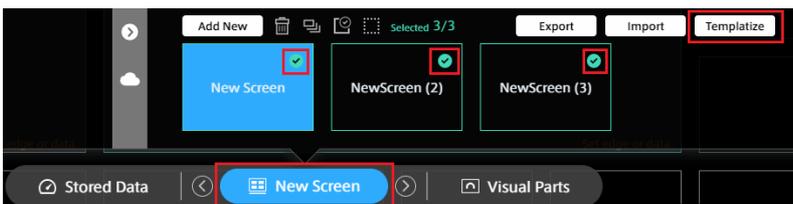


### Creating and sharing templates

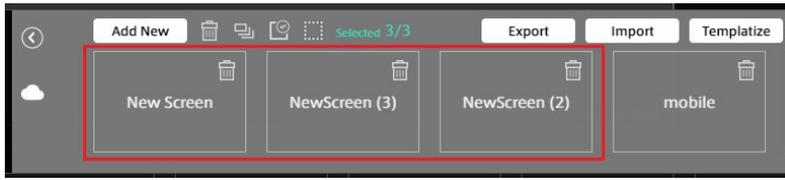
Templates created by users in the same domain can be shared.

Open the screen menu, select the  button of the screen to be shared, and then click the [Templatize] button.

\* Multiple screens can be selected.

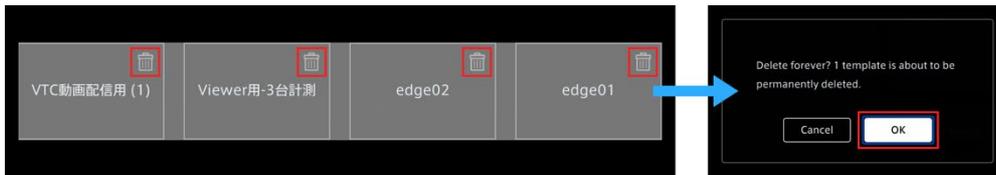


You can check the templates in the template list by selecting the  button.



## Deleting templates

You can delete created templates. Select  in the template, and then click the [OK] button in the confirmation dialog box.



### Point: About template deletion

- You can delete templates created by other accounts in the same domain.
- Templates that have been deleted cannot be restored.  
To use the same template as the deleted one, you need to recreate it.
- The default templates (which have no ) cannot be deleted.



## 6.8 Sharing screen: Export, Import

Screens can be shared by local PCs.

Export the screen and save it locally on the PC, and then import the screen to another PC.

### Export

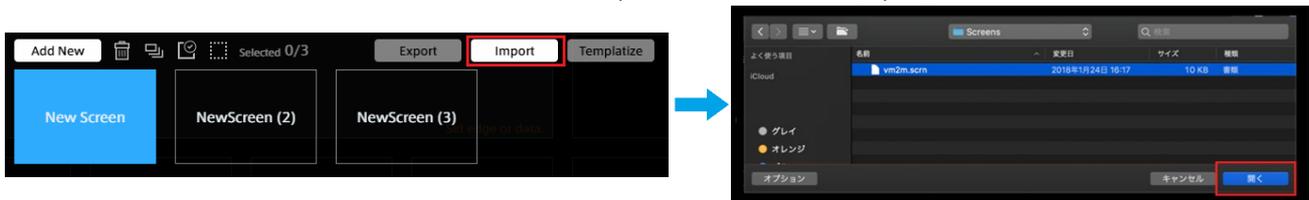
Mouse over the local screen to be shared, select the displayed  button, and then click the [Export] button. Multiple screens can be selected.

The screen definition file (.scrn) is stored in the local PC.



### Import

1. Click the [Import] button.
2. Select the screen definition file (.scrn) from the file explorer, and then click [Open].



## 07 Parse data

Measurement data is treated as binary data. Use parse data (DAT file) to display measurement data as physical values.

\* For vehicle CAN measurement, create parse data from a DBC file.

### 7.1 Reading target data

1. Select  (Data Settings) from the function menu, and then click the [Import] button.
2. Select the prepared parse data from the file explorer, and then click [Open]. Multiple pieces of parse data can be read.

\* For vehicle measurement, select a DBC file.



You can add individual definition files to an existing DAT data group.

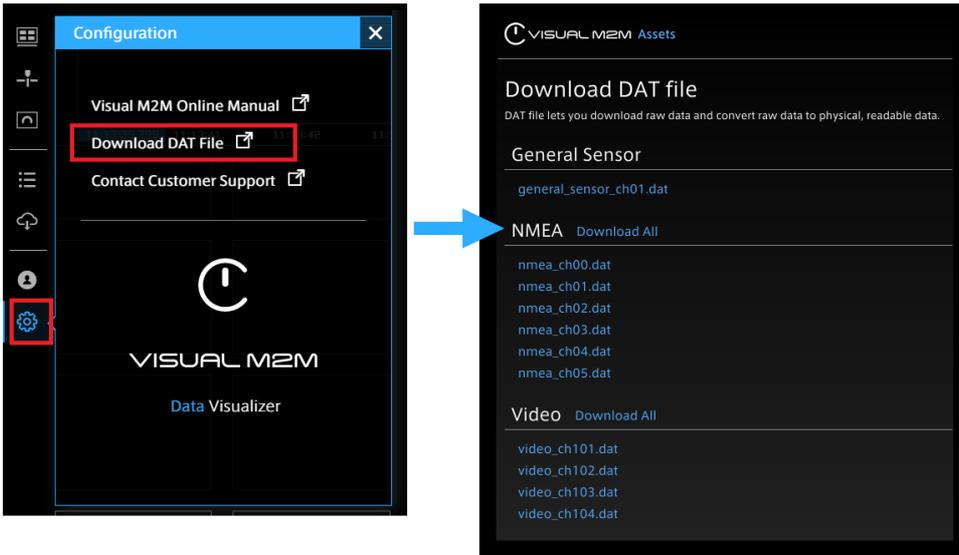


### 7.2 Downloading parse data files

You can download the default parse data provided on the server.

1. Select  (Config) from the function menu, and then select [Download DAT File].
2. Selecting the data name on the Assets window will start downloading the corresponding data.

You can collectively download parse data in the corresponding data group by selecting [Download all] at the right of the group name.



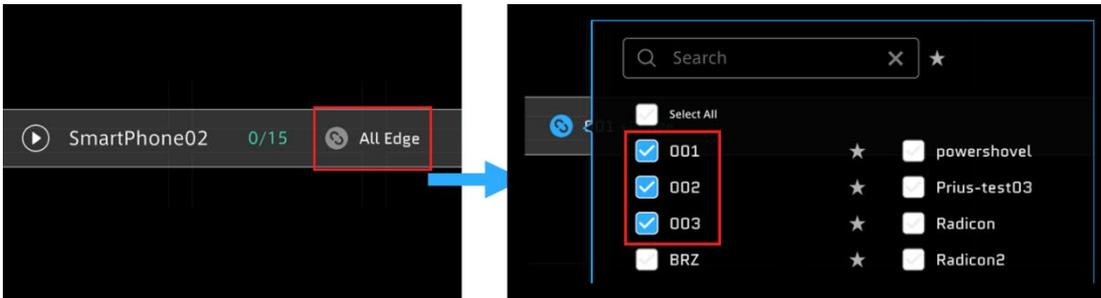
### 7.3 Linking data and edges

Parse data can be linked with an arbitrary edge.

If you perform linking, only the linked parse data will be displayed at the time of data binding.

1. Select [All Edge] of the data to be linked.
2. Select the link-target edge from the displayed edges.

\* Multiple edges can be selected.



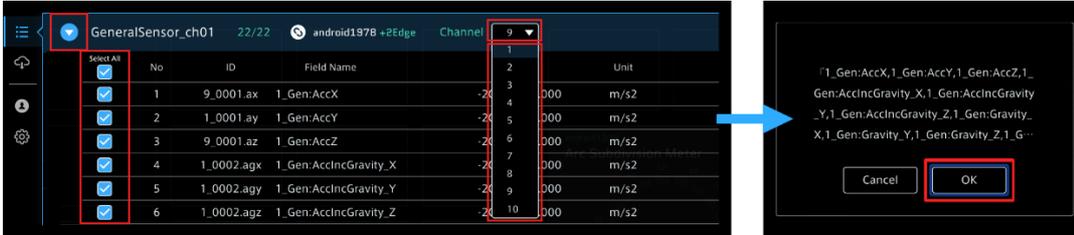
If there is an edge for which you want to cancel linking, deselect it.

## 7.4 Changing channels

Separate concurrent data streams with the same ID can be differentiated by adjusting the channel settings.

\* You can change the channels of multiple data at once.

1. Open the data group and select the check box of the data whose channel you want to change.
2. Select a number from the [Channel] list box.
3. Select the [OK] button in the dialog box.

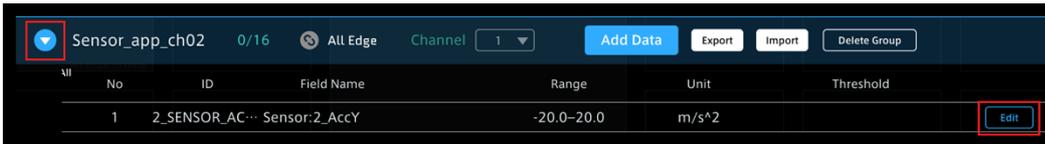


When you change the channel, the ID of the target data changes to {channel-number}\_{data-ID}.

For example, if you change the channel of data "1\_0002.agz" to 9, it becomes "9\_0002.agz".

## 7.5 Editing parse data

1. Select [Edit] at the end of the data row.



2. Set required items in the displayed Data Info window, and then click [Update].

For details about each item, see [7.6 Creating new parse data > Data info settings](#).



## 7.6 Creating new parse data

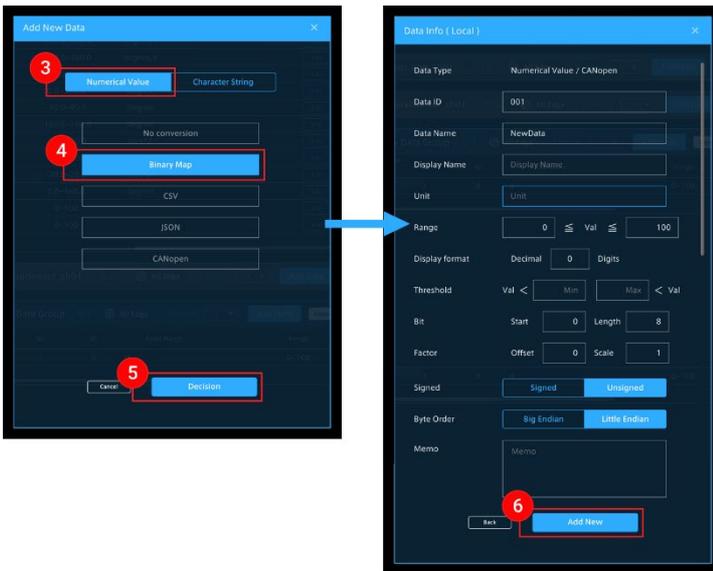
### Procedure for creating parse data

This section describes the commonly-used Binary Map data binding as an example.

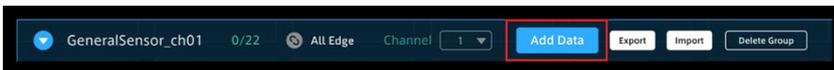
1. Click **1** [Add Group] to add a new parse data group.
2. Click **2** [Add Data] in the row of the newly added parse data.



3. Select the data type in the displayed Add New Data window (in this example, **3** [Numerical Value] and **4** [Binary Map] are selected), and then click **5** [Decision].
  4. Set items in the Data Info window, and then click [Add New].
- \* **6** [Add New] cannot be clicked unless [Data ID] and [Data Name] are entered.



When creating data in an existing parse data group, click [Add Data] for the corresponding data group.



## Data info settings

The setting items differ depending on the selected data type.

Setting item	Data type	Description	Remarks
Data ID	Common	ID of the data.	This is displayed in the ID item.
Data Name	Common	Name of the data.	This is displayed in the Field Name item.
Display Name	Common	Name to be displayed on the panel.	
Unit	Common	Unit of the data.	This is displayed in the data information.
Range	Common	Range of values of the data.	This is displayed in the Range item.
Display format	Common	Number of decimal places. The default value is 0. Up to 9 digits can be displayed.	A number from 0 to 9.
Threshold	Common	Threshold of the data. Setting this value allows a threshold error to be displayed on the panel when the specified threshold is exceeded.	For details about how to set thresholds, see <a href="#">7.9 Setting threshold of parse data</a> .
Bit	Binary Map, CANopen	Start: Analysis start position for the binary data Length: Length of bits to be analyzed	
Factor	Other than No conversion	Arithmetic operations on physical values extracted from binary data. [Offset] A value to be added to the extracted value. Negative numbers and decimal numbers can be set. [Scale] A value to be multiplied with the extracted value. You can enter decimals less than 1.	The default value is Scale: 1.
Signed	Binary Map, CANopen	Select whether a binary data is a signed or unsigned integer. [Signed] Read as a signed integer [Unsigned] Read as an unsigned integer	The default value is Unsigned.
Byte Order	Binary Map, CANopen	Specify the byte order of integer data. [Big Endian] Bits are recorded from the left. [Little Endian] Bits are recorded from the right.	The default setting is Little Endian.

CSV Field	Only CSV	[No.] Item number. You can enter a number from 0 to 999. [Separator] Separator: such as ",", ";", "#"	
JSON Field	Only JSON	Reference to a JSON file: File name or path name	
Memo	Common	Comment for the data.	

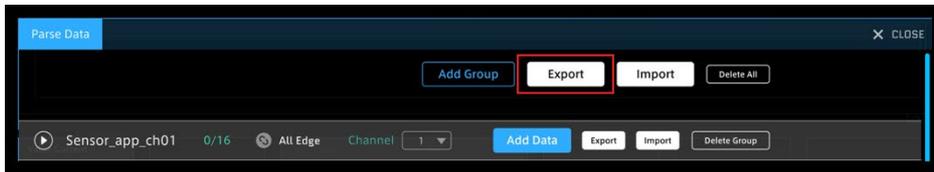
## 7.7 Sharing parse data

Export a parse data file.

Load the parse data file to another PC. For details about loading, see [7.1 Reading target data](#).

### Exporting all parse data

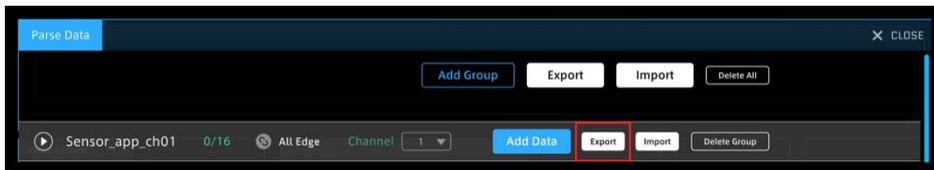
Click [Export] at the top of the Parse Data window.



All parse data files are stored in your local PC.

### Exporting an arbitrary parse data group

Select [Export] in the row of the target data group.

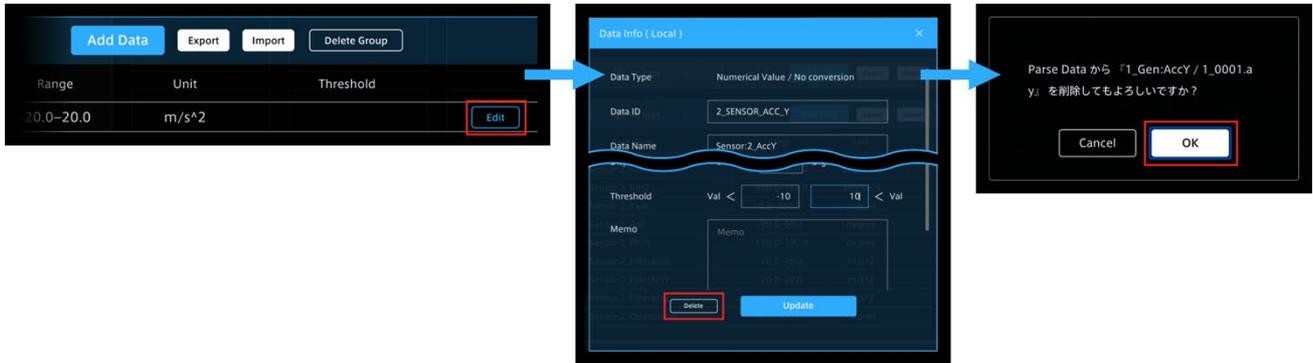


The selected data group is stored in your local PC.

## 7.8 Deleting parse data

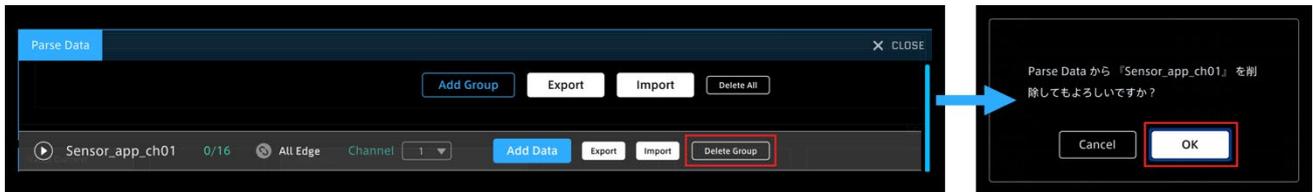
### Deleting individual parse data

1. Click the [Edit] button of the parse data you want to delete.
2. Click [Delete] in the Data Info window.
3. Click the [OK] button in the dialog box.



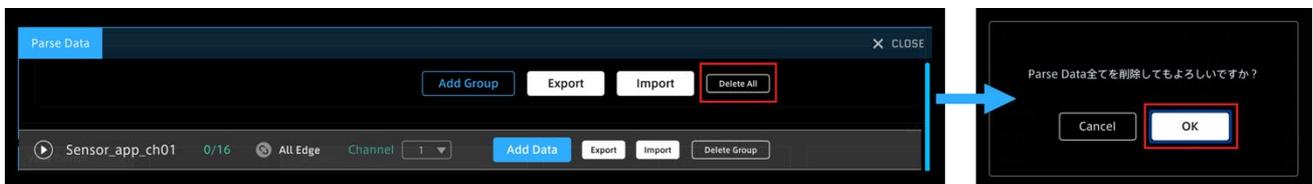
### Deleting a parse data group

1. Click [Delete Group] of the data group you want to delete.
2. Click the [OK] button in the dialog box.



### Deleting all parse data

1. Click [Delete All].
2. Click the [OK] button in the dialog box.



## 7.9 Setting threshold of parse data

Setting the threshold of parse data allows a threshold error to be displayed on the panel when the specified threshold is exceeded.

\* This function does not support line graphs.



### Procedure for setting the threshold

1. Open the data group, and then click [Edit] in the target data row.

No	ID	Field Name	Range	Unit	Threshold
1	2_SENSOR_AC...	Sensor:2_AccY	-20.0-20.0	m/s^2	

2. In the Data Info window, enter a threshold for the data.

Enter the lower threshold in **1**, and then enter the upper threshold in **2**.

The [Threshold] field in the list is updated and the threshold error condition is displayed.

**Data Info (Local)**

Data Type: Numerical Value / No conversion

Data ID: 2\_SENSOR\_ACC\_Y

Data Name: Sensor:2\_AccY

Threshold: Val < -10 & Val > 10

Memo:

[Cancel] [Update]

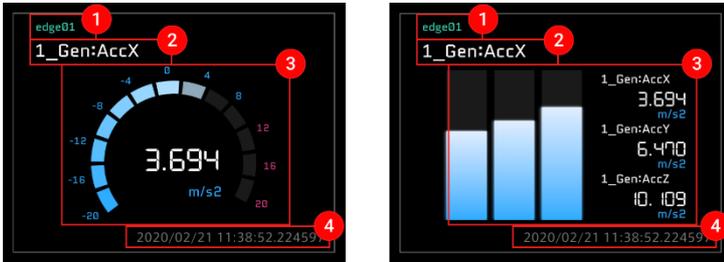
No	ID	Field Name	Range	Unit	Threshold
1	2_SENSOR_AC...	Sensor:2_AccY	-20.0-20.0	m/s^2	<-10 or >10

# 08 Data binding

Data binding is the arrangement of data displayed on the panels of a screen.

## 8.1 Panel configuration

A panel is an area where visual parts are displayed. You can set visual parts individually and change their display size.



Number	Data type	Description
1	Edge Name	The name of the edge bound to the panel.
2	Panel Name	The name of the panel. If this is not set, the first bound data name is displayed.
3	Display Area	An area to display the set visual part and the numerical values of the data. * The display format differs depending on the visual part type.
4	Timestamp	The time of data acquisition is displayed.

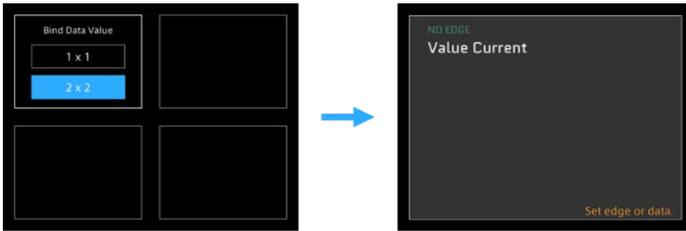
## 8.2 Data binding

### 1. Creating panels

Select the panel you want to create on the screen panel, and then select [1x1] or [2x2].



In the following example, [2x2] is selectable.

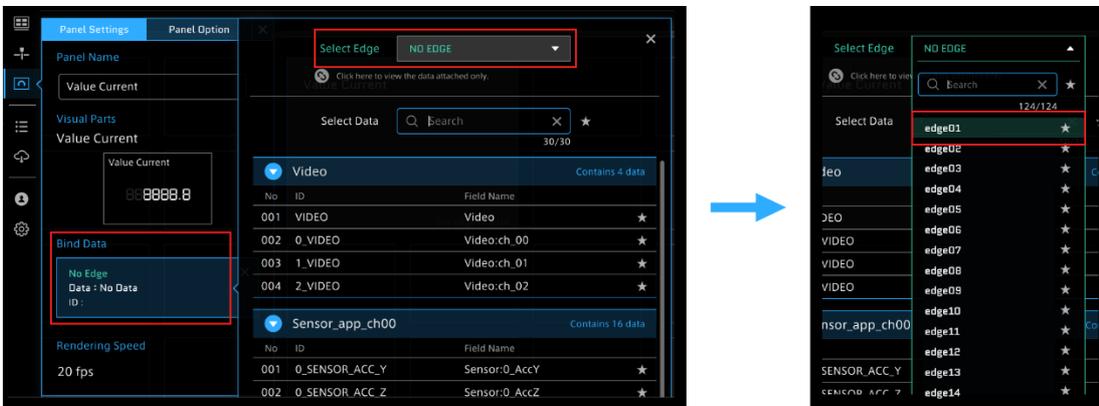


The following two images show two examples in which a "2x2" panel cannot be created.

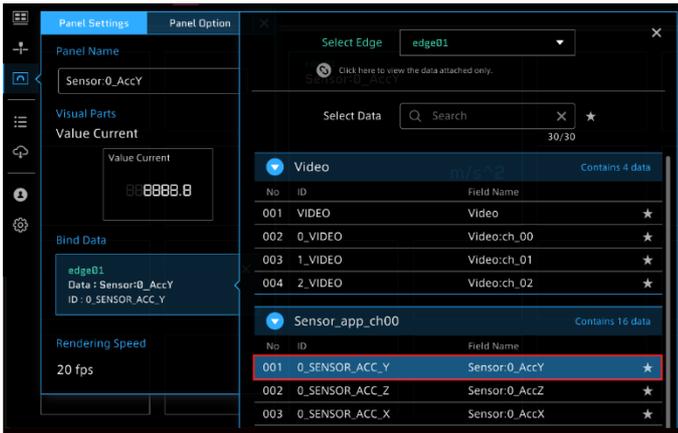


- 1 If another panel has been set in the required space
- 2 If there is no space for the right edge or last line of the window

1. Click [Bind Data] in Panel Settings.
2. Click [Select Edge] from the displayed window and select the edge from the list.

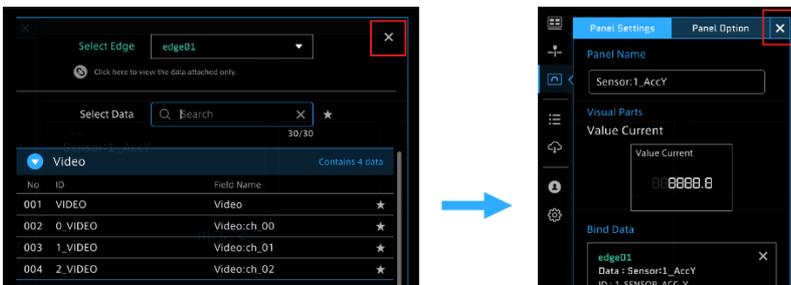


3. After the edge is set, select the data from the Select Data list.



3. When you have completed the settings of the edge and data, click **X** to close the window.

4. After you have finished the settings of each item, select **X** on the Panel Settings window, or select anywhere outside the Panel Settings window. The Panel Settings window closes, and the selected panel is released.



## 2. Setting visual parts

Next, set visual parts.

**Method 1** Click the [Visual Parts] button in Panel Settings, and then select one from the Visual Parts list.



### Method 2

Click [Visual Parts] from the content menu. Select a visual part from the Visual Parts list and drag and drop it on the target panel.



#### Point: Data binding from Visual Parts

You can also bind data directly from Visual Parts to a blank screen panel.

Click [Visual Parts] from the content menu.

Select the visual part you want to set from the list, and then drag and drop it on the screen panel.



Select Panel Name, set the items displayed on the Panel Settings window, and then set the edge and data.

#### Point: Searching and filtering visual parts

Visual parts can be searched by using the search form or filtering by category.

- Searching by name

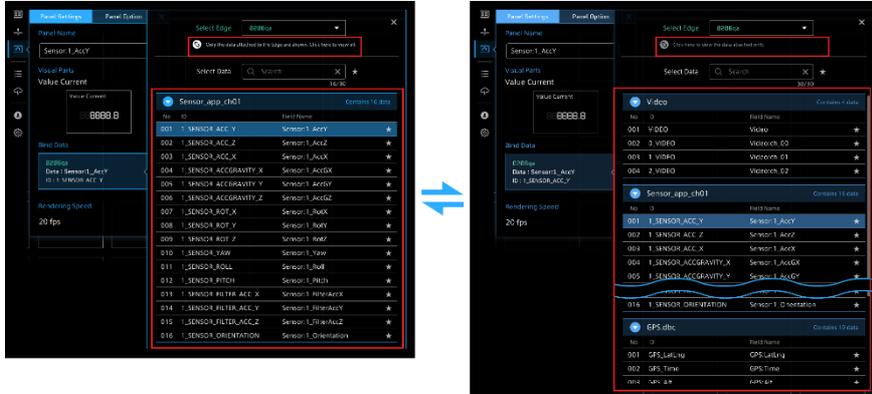


- Searching by category



### Point: Data linked with edges

When data is linked with edges, only the data linked with the selected edge is displayed. To display all data, select [Only the data attached to the Edge are shown. Click here to view all.].



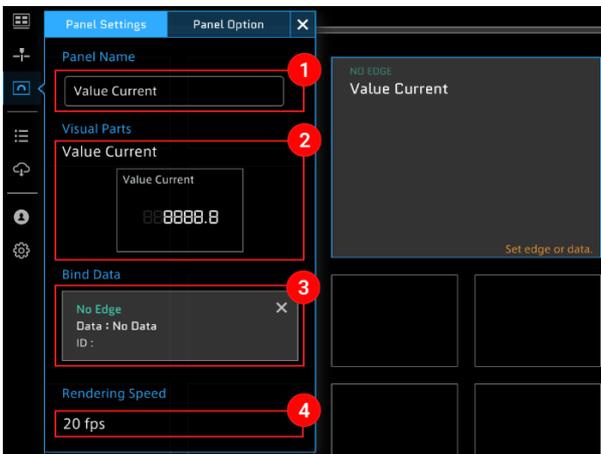
When [Click here to view the data attached only.] is selected, only the linked data is displayed again.

\* Data and edges must be linked in advance.

For details, see [7.3 Linking data and edges](#).

## 8.3 Changing the panel settings

Select the upper left area of the panel to set the items on the Panel Settings window.



Number	Item name	Description
1	Panel Name	Enter the name to be displayed on the panel. If this is left blank, the data name is displayed.
2	Visual Parts	Select a visual part.
3	Bind Data	Select an edge to be used as a data source and select data.
4	Rendering Speed	You can change the interval at which the parts on each panel are drawn. Reducing rendering speed should reduce the burden on the PC.

## 8.4 Setting multiple pieces of data

Depending on the visual parts, multiple pieces of data can be displayed simultaneously.

\* The maximum number of data pieces that can be bound differs depending on visual parts.

Click Panel Name of the panel for which you want to set multiple pieces of data.

Click the [Add New Data] button from Panel Settings, and then set the measurement data.



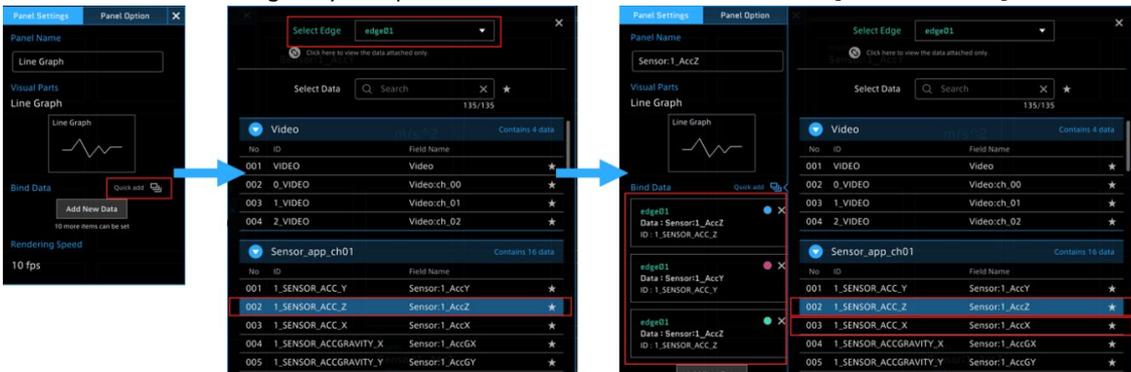
To close the Panel Settings window, select  on the Panel Settings window or select anywhere outside the Panel Settings window.

### Successive setting of Bind Data

Visual parts that can display multiple pieces of measurement data can bind data successively.

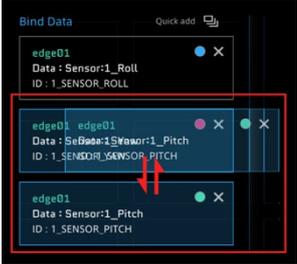
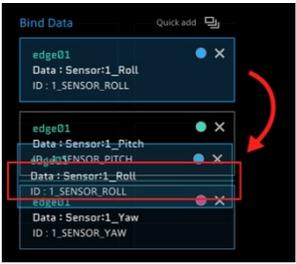
1. Click [Panel Name].
2. You can use [Quick add] to select multiple pieces of data successively with the data and edge selection window opened.

\* For normal data binding, only one piece of data can be selected each time [Add New Data] is selected.



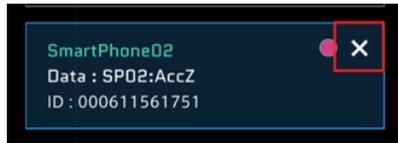
### About data sorting

You can sort data by a drag-and-drop operation.

	Replacement	Insertion
Image		
Operation	Drop the target on the card.	Drop the target in the gap between the cards.

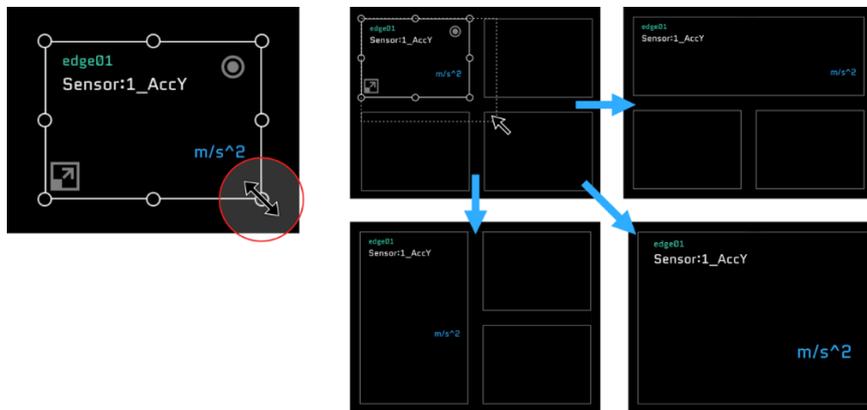
#### Point: To delete the added Bind Data

In the "Bind Data" items of Panel Setting, mouse over the data of the bind data you want to delete, and then select .



### 8.5 Changing the panel size

You can change the panel size by dragging the guide points on the edges displayed when you mouse over the panel.



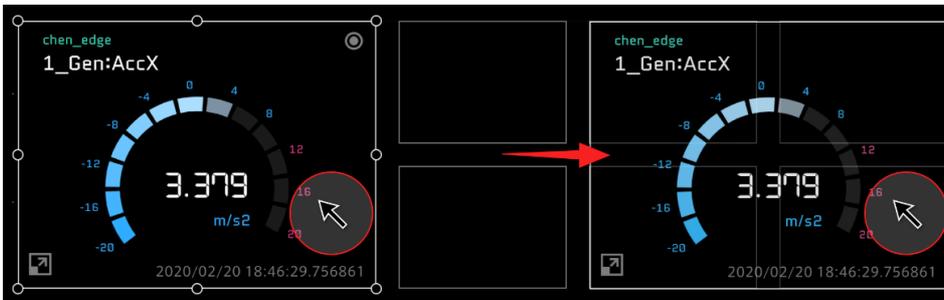
## 8.6 Switching the panel to full-screen display

You can enlarge or reduce the panel by pressing the  button at the bottom left of the panel.



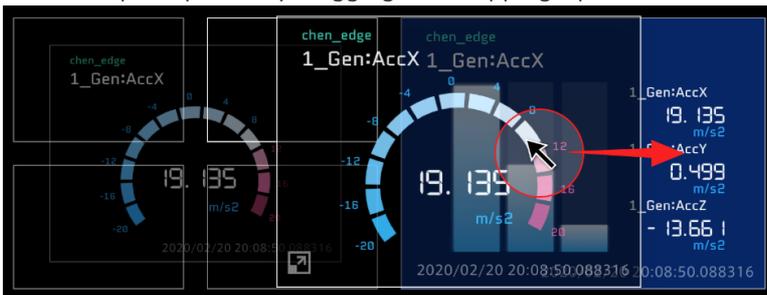
## 8.7 Changing the panel position

You can change the position of the panel by dragging and dropping the panel to a blank panel on the screen.



## 8.8 Replacing panels

You can replace panels by dragging and dropping a panel to an already set panel.



## 8.9. Copying panels

Drag and drop a panel while holding down the Alt key (the option key for Mac).  
The set data and option settings are all copied.



## 8.10 Deleting panels

Select  (Select All Panel) in the panel operation tool, and then select  (Delete Panel).



### Deleting individual data binds

Mouse over the panel you want to delete, and then select the displayed .

Select  (Delete Panel) in the panel operation tool.

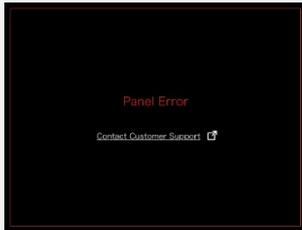


### Point Selecting panels within a rectangle

You can select an area of panels by clicking the mouse between panels (or on a blank panel), and then dragging it to create a rectangular selection area. All panels within the rectangle will be selected.

## 8.11 Error display

### Errors in panels

Message	Image	Generated when:	How to resolve:
Set bind data		No data is bound.	Bind data.
Set edge or data		Either edge or data is not set.	Set edge or data.
Data not loaded yet		Specified data is not yet loaded.	Reload the data.
Panel Error		Data has been bound in an unexpected format.	Contact Customer Support.

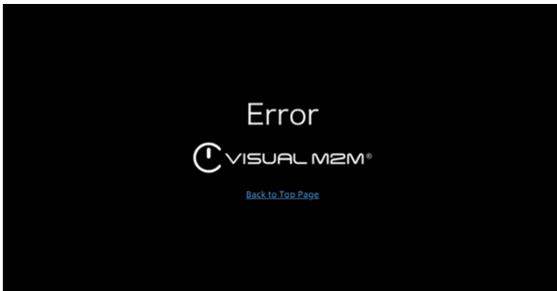
## Full-screen errors

When an error occurs that cannot be processed by a visual part alone or by certain configurations of visual parts, or if the error affects the screen only, the error will be displayed full-screen.



## Full-browser error

If the error affects the entire program, the entire browser will display an error message.



## 8.12 Showing data exceeding the thresholds

If the data itself exceeds the set thresholds, a threshold error will be displayed on the panel.

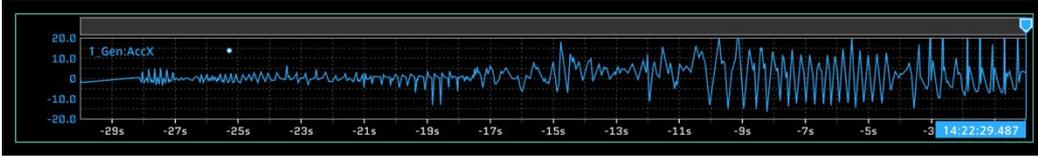
If multiple data items are being tracked, an error will be displayed even if the threshold for only one of the items has been exceeded.

\* This function does not support line graphs.



# 09 Timeline

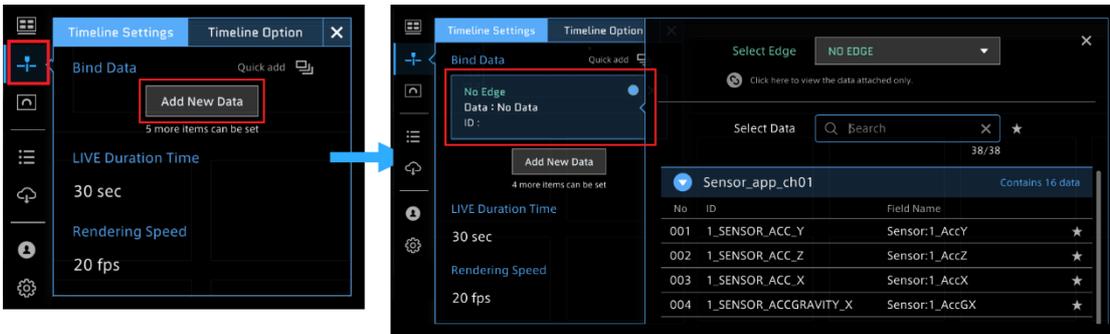
You can bind the main measurement data to the timeline. Measurement data is displayed as a line graph.



In real time playback, the specified time frame is displayed. In past data display, the entire time frame of the data is displayed.

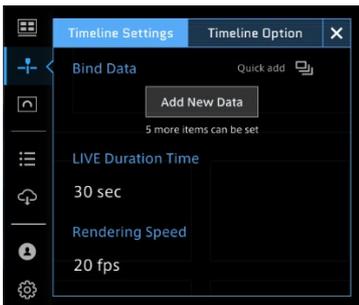
## 9.1 Binding data to a timeline

1. Select  (Timeline Settings) from the function menu.
  2. From the Data Bind item, select [Add New Data], and then set the measurement data to be bound.
- \* It is also possible to bind multiple measurement data items to a timeline (in the same way as Line Graph).  
 \* The method for binding data is the same as that for a panel. For details, see [8.2 Data binding](#).



In [Live Duration Time], specify the range of data to be displayed in real time on the timeline.

### Timeline Settings



Setting item	Required/Optional	Settings
Live Duration Time	Required	For live measurement, the time range of data to be displayed on the timeline. For example, if "30sec" is set, the data for 30 seconds from the current time is displayed. The default value is 30 seconds.
Rendering Speed	Required	You can change the rendering interval of the timeline. Reducing the rendering speed can reduce the burden on the PC.

## Timeline Option



Setting item	Required/Optional	Settings
Data Range	Optional	Set the maximum and minimum values of the vertical axis. (Up to five sets of values can be set.)
Step Forward (Sec)	Optional	You can set the frame advance width for Current Position.
Show Compared Position	Optional	ON: Compared Position (comparison position) is displayed. OFF: Compared Position is not displayed.
Threshold	Optional	ON: The threshold line set for data is displayed. OFF: The threshold line is not displayed.
Time (X) Interval (sec)	Optional	Set the interval width for the horizontal axis.
Max Number of Y Ticks	Optional	Set the interval width for the vertical axis.
Graph Interpolation	Optional	Set the form of a graph. Default: Curved line graph Step: Stepped graph

## 9.2 Cursor operation

The timeline can display adjustable cursors to indicate two separate points in time: Current Position and Compared Position.

### Current Position



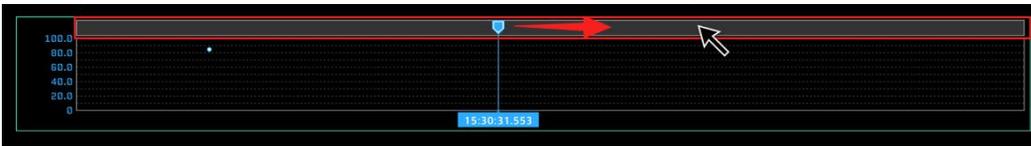
For real-time display, this will indicate the current point in time. For past data playback, this will indicate the stream replay point.

#### Method 1: Dragging Current Position



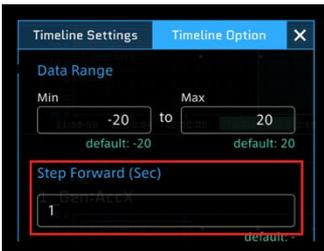
#### Method 2: Clicking a point on the timeline header

Click a point on the timeline header to move the cursor to that position.



#### Method 3: Timeline control

You can step backward or forward by selecting **⏪** (Backwards) and **⏩** (Forwards) on the timeline control. The width of cursor movement is determined by the value set in [Timeline Options] > [Step Forward].

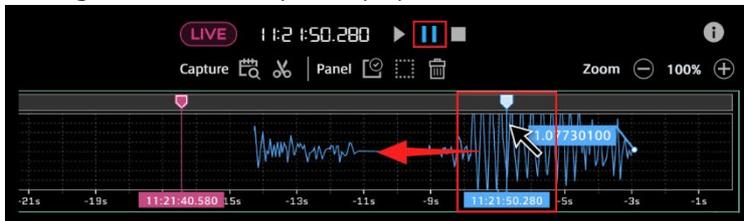


#### Method 4: Operation of the ← and → keys on the keyboard

Press the [←] key to rewind, and press the [→] key to advance. The timeline will continue advancing or rewinding as long as the key is held down.

### Point: Moving Current Position

Moving Current Position pauses playback.



After the operation is completed, for past data playback, the state prior to the drag operation (pause state/playback state) is applied.

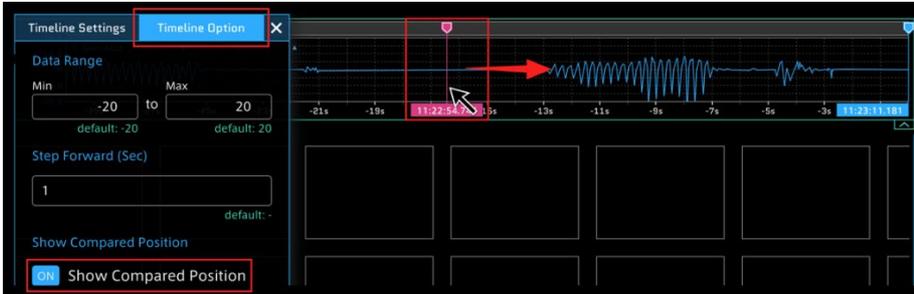
For real-time playback, playback remains paused.

## Compared Position



Compared Position is used as a position comparative to the Current Position. The differences in values between the Compared and Current Positions can be displayed.

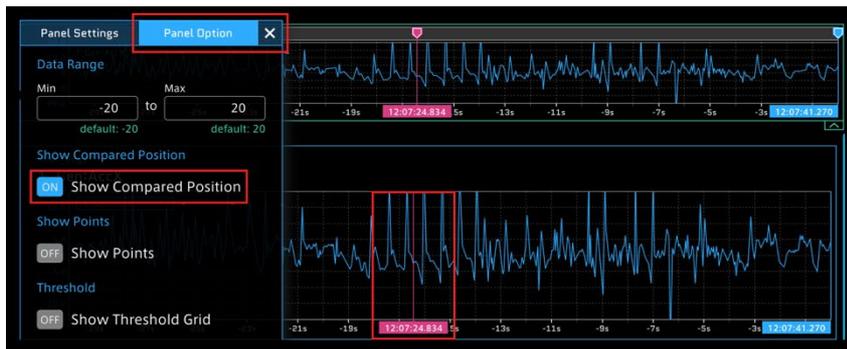
To display Compared Position, select [Timeline Settings] from the function menu. Then, in the [Timeline Option] tab, set [Show Compared Position] to ON.



For both Compared Position and Current Position, the cursor can be moved via drag and drop operation.

### Point: To display Compared Position on Line Graph

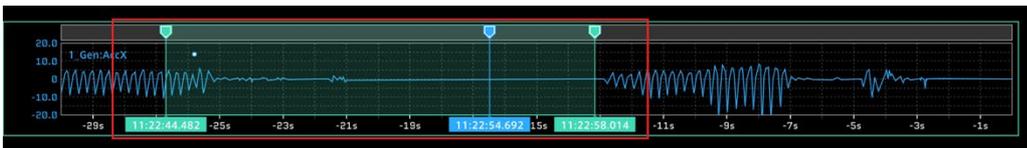
1. Select the Panel Name on Line Graph, and then select [Panel Option].
2. Set [Show Compared Position] to ON.



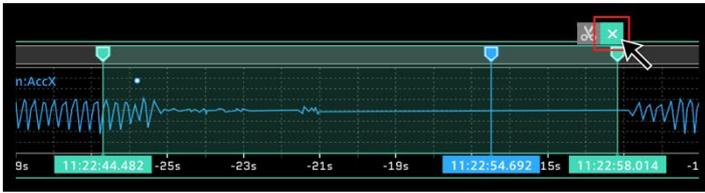
## Specifying the timeline range

When you drag the mouse to select an arbitrary time range on the timeline, a green cursor is displayed. You can use this green cursor to specify the display time range of the measurement data on the panel. Depending on the visual parts, the measurement data within the specified time range can be displayed.

\* If the time range is not specified, the measurement data is displayed with the entire timeline.



You can cancel the range specification by using the  button in the menu displayed in the upper right when hovering the mouse over the green cursor.



### Setting timeline details

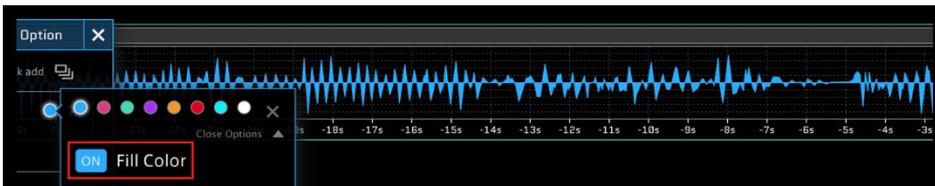
In [Timeline Settings], you can change the color or transparency of the timeline. Select the colored circle in [Bind Data] to open the advanced color settings.

### Changing graph color



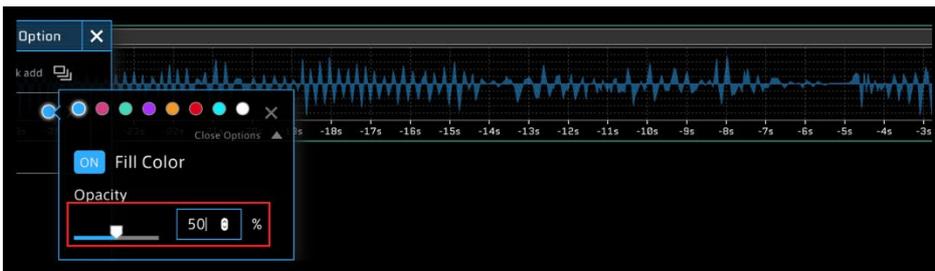
### Filling graph

Click [Fill Color] to set it to [ON] to fill the displayed graph with the color.



### Changing the transparency of the graph

You can change the transparency by dragging the [Opacity] slider or by directly entering a number.



\* The above settings are also available from the Panel Settings window for Line Graph in visual parts.

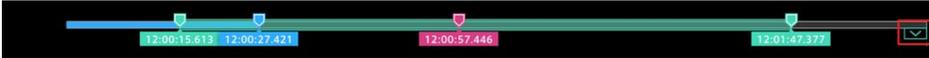
## 9.3 Switching the display size

You can switch the display size between normal display and reduced display by using the button at the bottom right of the timeline.

[Normal display]

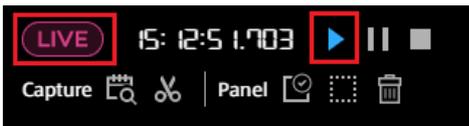


[Reduced display]



## 10 Playing measurement data in real time

1. Change to Live Mode in the timeline control.
2. Click  (Play).



When the edge set on the screen is streaming the target data, the data is displayed on the panel on the screen.

### Point: To display measurement data in real time

The measurement edge and data need to be bound to the screen. For details about how to bind data, see [8.2 Data binding](#).

If the measurement data is not displayed, confirm that the edge and data are correctly selected in the data binding to the panel.

# 11 Playing back and capturing past measurement data

## 11.1 Types of past data

There are three types of Stored Data.

Type	Description
Measurements	Data from the start to end of measurement
Markers	Markers added to measurements
Captures	Data cut out from a measurement by specifying a time range as necessary. For details, see <a href="#">11.5 Creating a capture (record within a specified time frame)</a> .

### Measurements

Number	Description
1	Measurement date
2	Measurement status
3	Measurement UUID
4	Measurement name
5	Measurement length
6	Start time and end time
7	Name of the edge that created this measurement

Number	Description	Number	Description
1	Measurement date	5	Measurement length
2	Measurement status	6	Start time and end time
3	Measurement UUID	7	Name of the edge that created this measurement
4	Measurement name		

### 2 Measurement status details

Icon	Status	Icon	Status
	Live measurement in progress		Measurement completed
	Live measurement in progress (with missing data)		Measurement completed (with missing data)

## Markers

Measurement ID	Duration	Time Range	User	Tags
S2E-beb5c5	35m 31s	13:08:26–13:43:58	qa-edge11	Car: FIT コース: その他 + 3 tags
S2E-11f775	15s	12:19:24–12:19:39	qa-edge11	Car: FIT コース: その他 + 3 tags
S2E-f7420e	10m 44s	12:07:35–12:18:19	qa-edge11	Car: FIT コース: その他 + 3 tags
S2E-4bc2de	02m 09s	11:59:58–12:02:07	qa-edge11	Car: FIT コース: その他 + 3 tags

Markers that have been given to measurements with other applications are displayed. If there are tags with key-value pairs, they will also be displayed **1**.

## Captures

Measurement ID	Duration	Time Range	User	Actions
test2	25s	18:50:57–18:51:22	edge1	
test1	32s	18:50:51–18:51:23	edge1	
test	01m 10s	18:44:30–18:45:40	edge1	<b>1</b> Edit <b>2</b> Delete

When you mouse over the data item, the **1** [Edit] button and **2** [Delete] button appear. For details about how to create a capture, refer to [11.5 Creating a capture \(record within a specified time frame\)](#).

## 11.2 Replaying past data

1. Select [Stored Data] from the content menu.



2. Select Measurements, Markers, or Captures. Past measurements are displayed in chronological order.
3. Select the measurement you want to display.

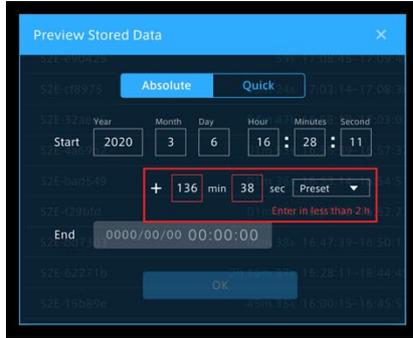


### Point: Captures list

The Captures list shows the captures you have created, and all captures created by device-type edges. Captures created by other user-type edges are not displayed.

### Point: Measurement that exceeds the display limit

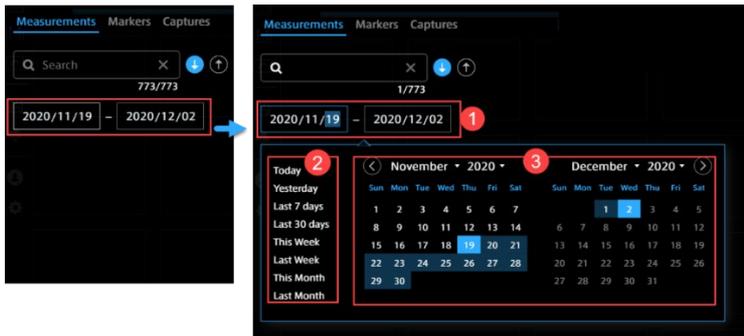
If you specify a measurement that exceeds the displayable time, the [Preview Stored Data] window appears. Specify a time range in the [Preview Stored Data] window.



## 11.3 Searching for past data

### Searching by period

Click the date area to set the period. There are three ways to set the period, as follows.



Number	Description
1	Enter the dates with keyboard.
2	Select a preset period. You can select a value such as "Today", "Yesterday", "Last 7 days", and "Last week", from the menu on the left.
3	Select the dates on the calendar.

**3** Description of calendar notation

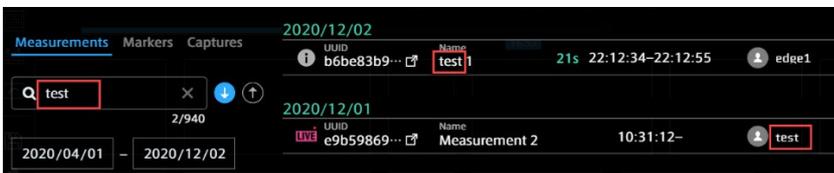
Icon		Icon	Description	Icon	Description
	Normal date		Current date		Future date * Cannot be selected
	Date in the selected period		Start date or end date of the selected period		

### Searching in the list

In the Measurements list, you can search by measurement UUID, measurement name or edge name.

In the Markers list, you can search by marker name, edge name, or tag value.

In the Captures list, you can search by the name of a capture.



## 11.4 Specifying the playback time range

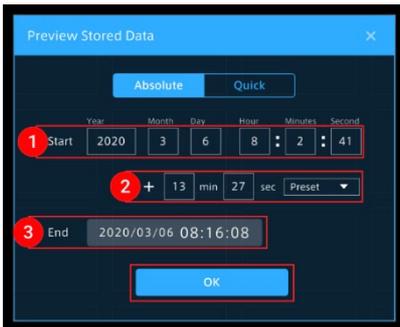
You can replay the measurement data by specifying an arbitrary time range.

Click  (Preview Stored Data) on the timeline control.



Absolute mode and Quick mode are provided to specify a period of past data.

### Absolute mode



This specification method is based on the start time.

1. In the [View Previous Data] window, enter the start date and time and the playback period of the past data you want to display.
2. After completing the settings, click [OK]. After the data is loaded, the data is played from the specified start time

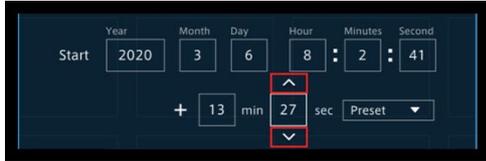
Number	Description
<b>1</b>	[Start] Enter a specific start time (seconds can also be set)
<b>2</b>	[+min,sec] Enter the length of the playback time of the data. (For details, see Point below.)
<b>3</b>	[End] End time of the data playback (optional). The calculation result from <b>1</b> and <b>2</b> is displayed.

### Point: How to enter the playback period

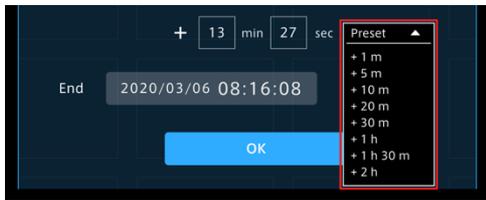
There are three ways to enter the playback period.

Method 1: Directly enter numbers in the [min] and [sec] boxes.

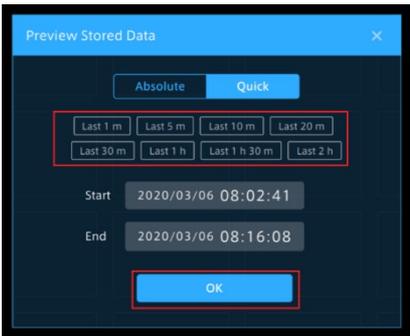
Method 2: Mouse over the [min] or [sec] box, and then click the displayed arrows. The time can be set in minutes/seconds.



Method 3: Click [Preset], and then select a preset from the base time provided by the system.



### Quick mode



This specification method is based on the current time. You can set the period from 1 minute to 1 hour before the current time.

Select [Last XX], and then click the [OK] button.

## 11.5 Creating a capture (record within a specified time frame)

You can specify the data start time and end time, and then register them as a capture in Stored Data.

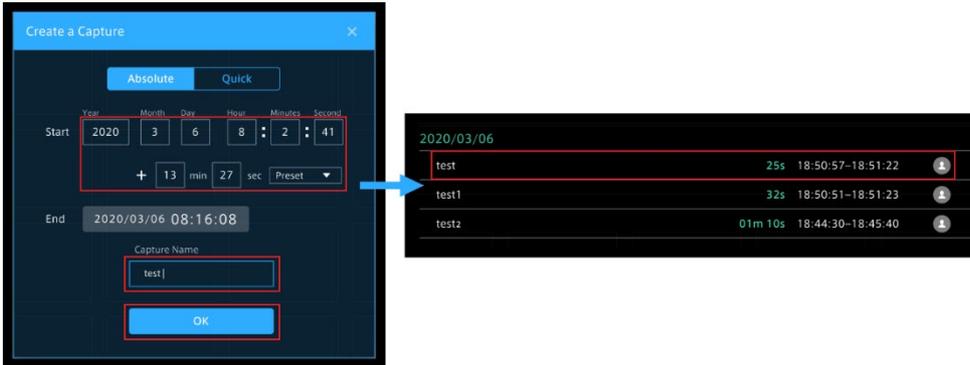
There are two ways to specify the time.

### Method 1: Directly entering the time

1. Click  (Create a Capture) on the timeline control.



2. Enter the start/end date and time of the data you want to register as a capture and the capture name, and then click [OK].

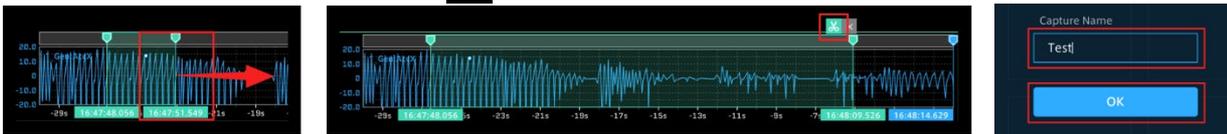


When you select the registered capture, data playback is started.

## Method 2: Specifying the time on the timeline

You can specify an arbitrary period within the measurement on the timeline.

1. Click the start time and drag it to the end time. The area in light green means the specified period.
2. Adjust the specified period and click .



3. Enter the capture name in the displayed [Create a Capture] window and click [OK].

### Point: Adjusting the specified period on the timeline

[Adjustment of the start time and end time]

Fine-tune the time frame by dragging the green cursor and click the [Create a Capture] button.



[Adjustment without changing the length of the specified period]

Drag the light green area between the cursors to move it to the left or right. You can adjust the start time and end time while keeping the length of the specified period.



### Point: Captures list

The Captures list shows the captures you have created, and all captures created by device-type edges. Captures created by other user-type edges are not displayed.

## 12 Timeline control operation

You can control real-time display and past data display by using the timeline control.

### Play

Starts playing of real-time or past data.



### Pause

Pauses playback and provides analysis of the data at the point paused.



### Stop

Stops playback and clears the panel data. The data of the panel is cleared.



### Repeat

Repeats playback when playing back past data.



#### Point: Displaying data at a particular timestamp in the past data playback

Double-click the Master Timestamp on the timeline control.



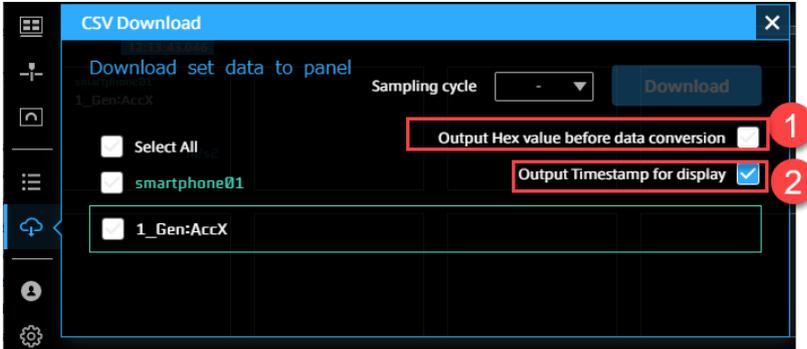
Input a timestamp to go to that time point instantly. This allows you to snap to precise points in time, which is more difficult to do from the seek bar.

\* For details about how to operate the cursor, see [9.2 Cursor operation](#).

# 13 Downloading measurement data in CSV format

## 13.1 Types of CSV downloading

There are the following two types of optional settings for CSV downloading.



### 1 Output Hex value before data conversion

If checked, pre-conversion binary data (CAN data from vehicle measurements for example) is downloaded as hex values. Example of output:

OFF: Physical value		ON: Hex value	
#timestamp	Speed@209[brz01]	#timestamp	209[brz01]
1494997200	35.7	1494997200	0xCA020000
1494997200	35.75	1494997200	0xCB020000
1494997200	35.6	1494997200	0xC8020000
1494997200	35.7	1494997200	0xCA020000

### 2 Output Timestamp for display

If checked, timestamps are added to the first row for date-time display. Example of output:

#time string	#timestamp	Speed@209[brz01]
'2017/05/17 14:00:00.018779	1494997200	35.7
'2017/05/17 14:00:00.038916	1494997200	35.75
'2017/05/17 14:00:00.058818	1494997200	35.6
'2017/05/17 14:00:00.078910	1494997200	35.7

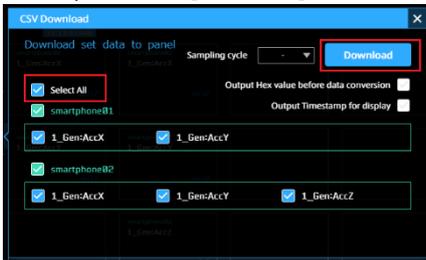
#### Point: Naming rules for output files

yyyymmddhhmmss-yyyymmddhhmmss.csv  
{start date and time}-{end date and time}

## 13.2 CSV downloading

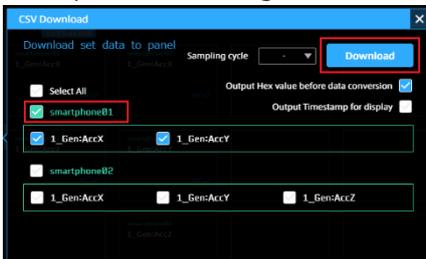
### CSV downloading for data from all panels

When you check [Select All], a CSV file for data from all panels is downloaded.



### CSV downloading for each edge

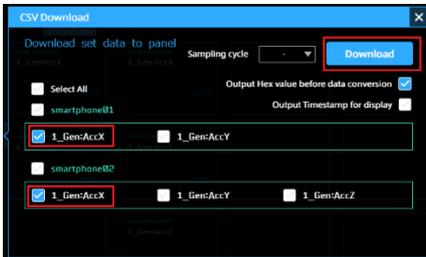
When you select the edge name, a CSV file for data from the selected edge panel is downloaded.



### CSV downloading for each data

When you select the data name, a CSV file for the selected data is downloaded.

\* Data items can be selected from different edges.



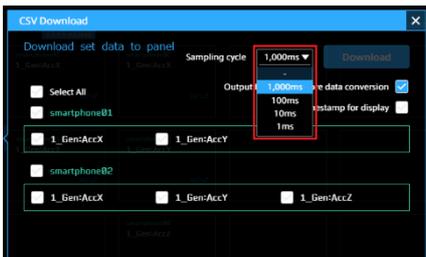
### Setting the sampling period

You can use the “Sampling Cycle” box to set the sampling period of the data.

Data will be outputted at the rate determined by the specified sampling period.

\* The value at the most recent time in the period will be set as the value of the data.

\* If there is no preceding data, the data will be set as blank.



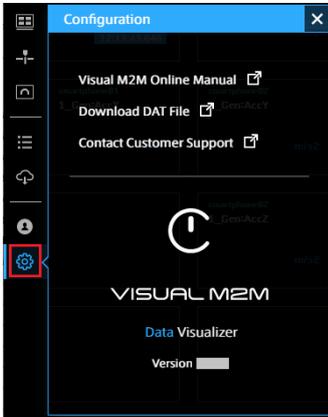
### Sampling period values

- (none), 1000 ms, 100 ms, 10 ms, 1 ms

# 14 Config

In the Config menu, you can display links and check the version information of the product.

Select [Config] from the function menu.

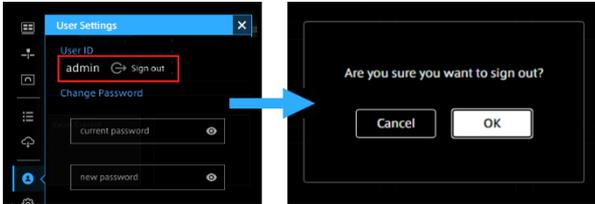


Item	Description
Visual M2M online Manual	Accesses the online manual of Visual M2M.
Download DAT File	Downloads parse data. For details, see <a href="#">7.2 Downloading parse data files</a> .
Contact Customer Support	Accesses the inquiry form on the aptpod homepage.
Version XX	Displays the product version.

# 15 User Settings

## 15.1 Signing out

1. Select [User settings] from the function menu, and then click [Sign out].
2. Click [OK] in the sign-out message dialog box.



## 15.2 Changing password

1. Enter your current password, and then enter your new password two times.
2. Click [Save Changes].



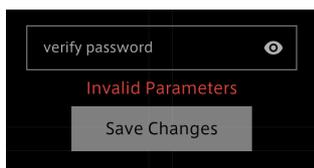
### Point: Resetting password

1. If you cannot click [Save Changes], confirm that:



- The current password is correct.
- The [New password] and [Verify password] items match.
- All the items have been entered.

2. If the "Invalid Parameters" error appears after clicking [Save Changes], confirm that:

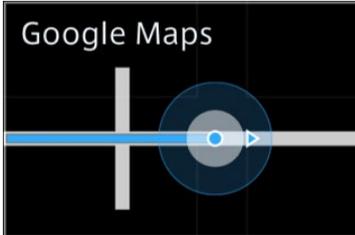


- The current password and new password are not the same.

# 16 TIPS: How to use visual parts

## 16.1 Map

### Google Maps



#### To display Google Maps

To use the Google Maps visual parts, you need to bind at least latitude and longitude data. For details about how to bind data, see [8.2 Data binding](#).

#### Latitude and longitude of edges (mandatory)

The Google Maps visual parts determine the bound data whose data ID or data name includes "LAT" as latitude and the bound data whose data ID or data name includes "LNG" or "LON" as longitude (case-insensitive).

001	1_??RMC.latDeg	1_RMC_Lat	★
002	1_??RMC.lngDeg	1_RMC_Lng	★

#### Point: For general sensors such as smartphones

Use the parse data file "GeneralSensor\_chxx.dat" and select [Lat] and [Lng]. "GeneralSensor\_chxx.dat" can be downloaded from the [Assets page](#).

016	1_0006.lat	1_Gen:Lat	★
017	1_0006.lng	1_Gen:Lng	★

⚠ If the parse data channel and the edge channel do not match, the edge cannot be displayed.

#### Edge direction

You can display the direction of the edge on the map by binding the direction data. The Google Maps visual parts determine the bound data whose data ID or data name includes "HEAD" or "DIRECTION" as direction (case-insensitive).

006	1_??RMC.direction	1_RMC_direction	★
-----	-------------------	-----------------	---

#### Point: For general sensors such as smartphones

Use the parse data file "GeneralSensor\_chxx.dat" and select [Head].

021	1_0009.head	1_Gen:Head	★
-----	-------------	------------	---

### Other data

You can also bind data other than latitude, longitude, and direction. Of the data other than latitude, longitude, and direction, the first data is displayed as a balloon on the map.

### Example of setting and display

In the following example, the data items of latitude (Lat), longitude (Lng), and direction (Head) are bound. Other than those, the speed (Speed) and the altitude (Alt) are bound, and the first data (speed) is displayed as a balloon on the map.



- 1 Edge location (latitude, longitude) 2 Edge direction 3 Edge name 4 Other data

#### Point: If no edge is displayed on Google Maps

1. Confirm that the latitude and longitude data is set.
2. Confirm that the data and measurement edge channels are identical. If they are different, the edge cannot be displayed.
3. Check the communication environment of the edge and Data Visualizer.

## Window operation

When you mouse over the Google Maps panel, a list of operation icons appears at the bottom right of the panel.

Icon	Operation
	Changes the map type with each click.
	When this is set to ON, the travel track is displayed. 
	Changes the edge displayed at the center of the window. Displays all edges, or focuses on a particular edge.
	Enlarges the map display.
	Reduces the map display.
	When this is set to ON, the map is displayed in full screen on the back of the screen. When this is set to OFF, the map is displayed in the panel.

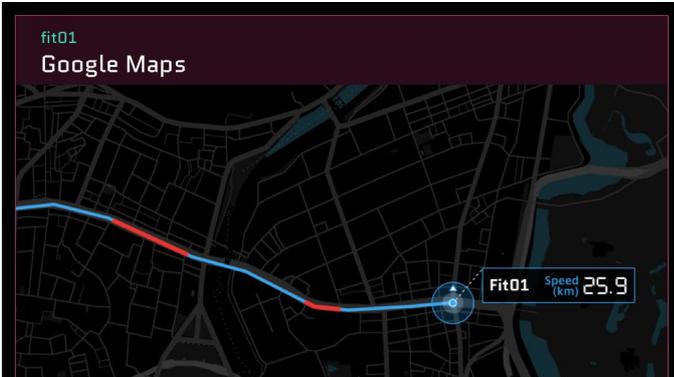
## Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	Enter the name to be displayed on the panel.
Bind Data	Required	See " <a href="#">To display Google Maps</a> ".

## Panel Option

### Threshold

Setting to show the track of travel exceeding the threshold.



When this is set to ON, if the data displayed in the balloon on the map exceeds the threshold, the track of the part where the threshold is exceeded is shown in red. For details about how to set thresholds, see [7.9 Setting threshold of parse data](#).

## 16.2 Media

The Media visual parts display videos. Each part supports different video formats.

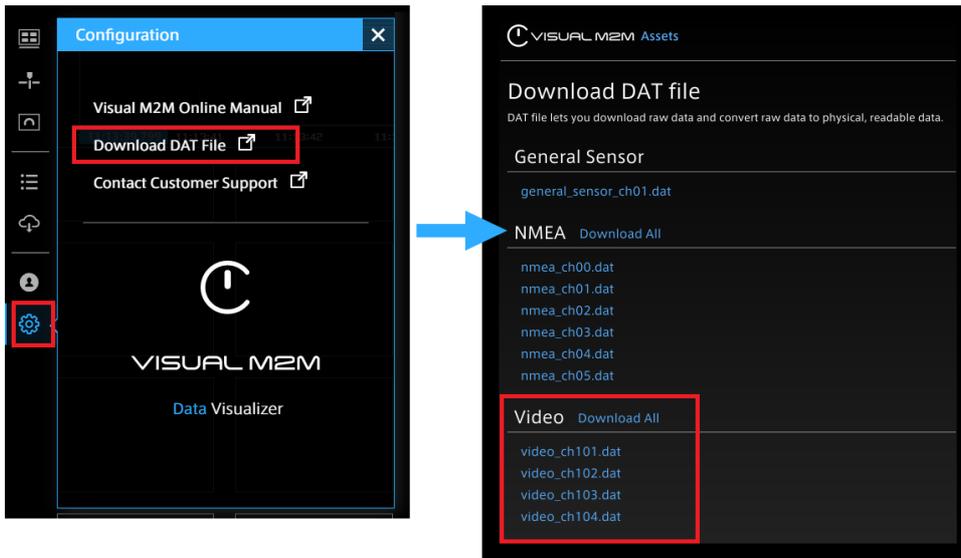
Part name	Thumbnail	Supported video format
Video Player		FMP4/ HLS / MP4
Image Viewer		Motion JPEG

### To display a video on the Media panel

You need to bind video-related parse data.



Video.dat can be downloaded from Assets.



**!** Data cannot be displayed unless the parse data channel and the edge channel match. Check the edge channel in advance.

**Point: Visible area of video**

The visible area of video on the panel changes depending on the aspect ratio of both the panel and the video. Adjust the panel size according to the ratio of the actual video. See [8.5 Changing the panel size](#).

**If video is not displayed**

When video cannot be displayed, the panel is displayed as follows:



If video is not displayed, check the following points.

1. Has the measurement begun?
2. What is set as the codec on the edge side?
  - When H.264 is set, use Video Player.
  - When MJPEG is set, use Image Player.
3. Do the channels of the parse data and the measurement edge data match?

For example: Since the channel of Video:ch-01 is 01, only the edge videos whose channel is 01 can be displayed.

4. Is the Internet environment (such as line speed) appropriate?

## Display and operation of Media



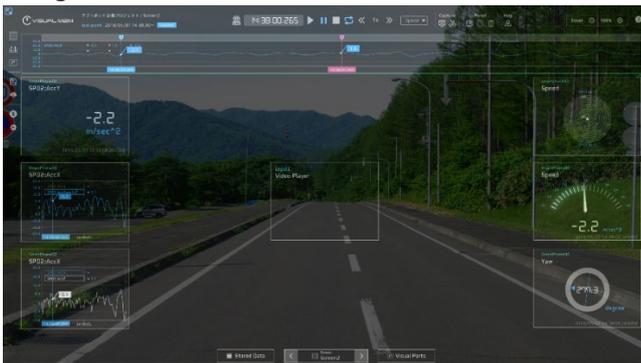
1 Edge name, panel name

2 Timestamp of the video being replayed

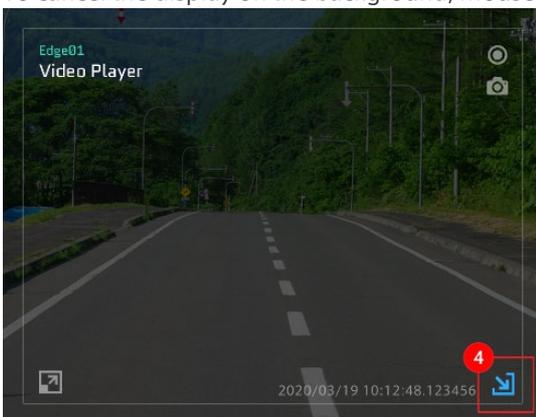
When you mouse over the panel, the 3 and 4 operation buttons are displayed.

3 When this button is pressed, a still image is captured and downloaded.

4 Media is displayed as the background. When this button is selected, the video is displayed on the entire background.



To cancel the display on the background, mouse over the panel again and select 4.



**Point: About capture download**

- The size of the downloaded capture will be the size of the source video.
- The capture download button only appears when a video is displayed.

**Point: About video download**

Videos acquired with H.264 codec can be downloaded from the measurement details screen of the Meas Hub application. In this case, the video is downloaded as an MP4 file and does not contain any audio or timestamp by intdash.

**Media Panel Settings**

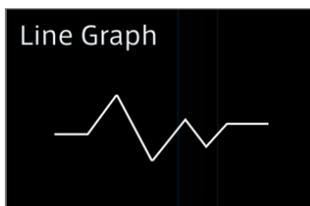
Setting item	Required/Optional	Settings
Panel Name	Optional	Enter the name to be displayed on the panel.
Bind Data	Required	See " <a href="#">To display a video on the Media panel</a> ". * The maximum number of data items that can be bound is 10.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

**Media Panel Option**

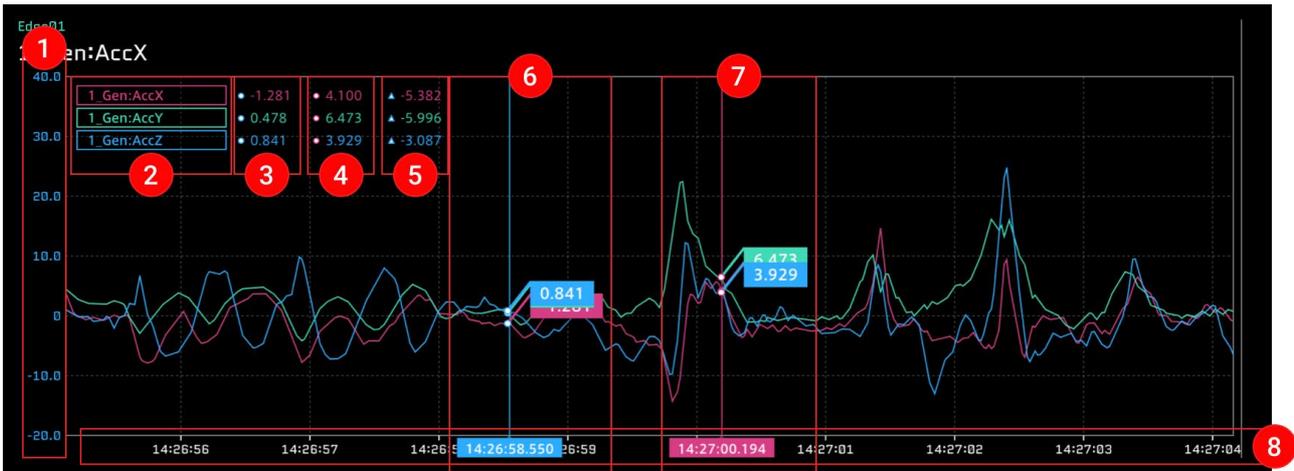
Setting item	Required/Optional	Settings
Audio	Required	This is the setting to switch the mute setting of the video. The default is "ON" (audio off).
Start Time Offset	Optional	Adjust the start time of the playback. If the playback time of the video is different from the other data, you can make adjustments to match the time axis of the video and other data. (Up to 0.01 s accuracy)

**16.3 Graph**

**Line Graph**



### Description of the window



\* Up to 10 data items can be bound.

1 The vertical axis that represents the data value. This can be set with the [Data Range] item in the Panel Option window.

2 Field name of the data. You can click these items to show or hide the data. For details, see "[Showing or hiding data](#)".

3 Value of Current Position.

4 Value of Compared Position.

5 Difference value obtained by subtracting the value of Compared Position from the value of Current Position.

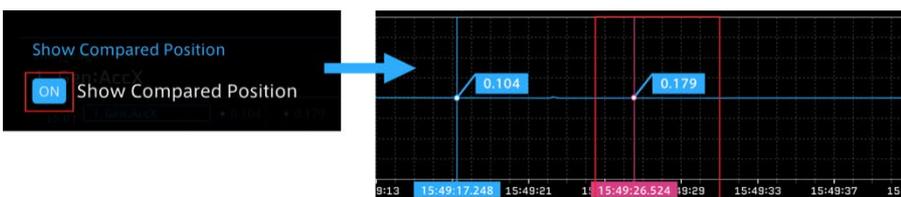
6 Current Position (instantaneous value).

7 Compared Position (comparison position).

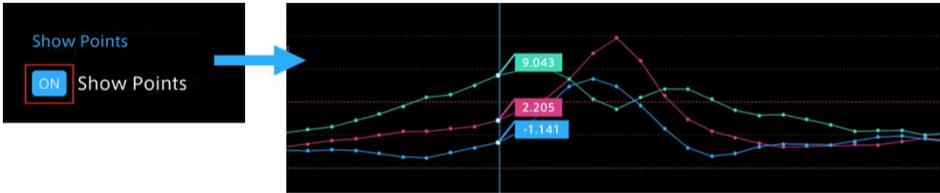
8 The horizontal axis that represents time. This can be set with the [Time (X) Interval] item in the Panel Option window.

### Panel Option

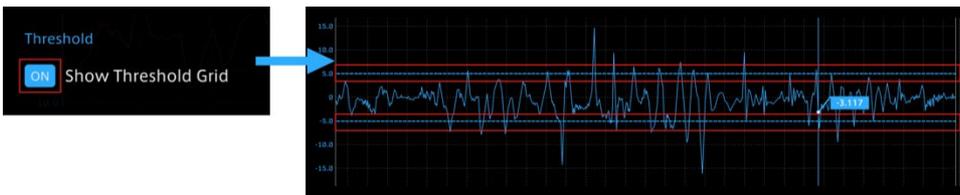
Setting item	Required/Optional	Settings
Data Range	Optional	Set the maximum and minimum values of the vertical axis. Multiple scales can be displayed on the left scale only when [Relative (relative display)] is set in the [Graph Scale] item.
Show Compared Position	Optional	ON: Compared Position is displayed.



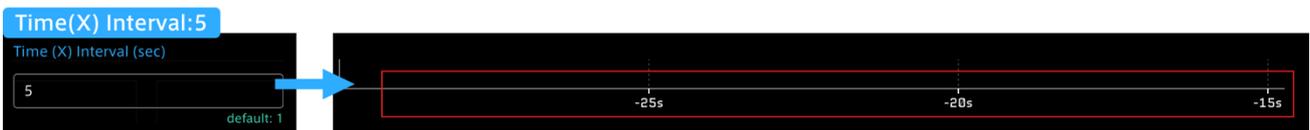
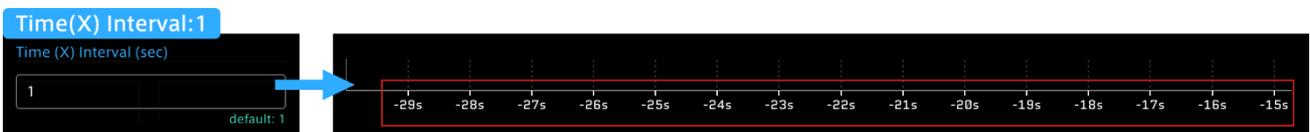
Setting item	Required/Optional	Settings
Show Points	Optional	ON: Sampling points are displayed when the display range is specified. * They are not displayed if the display range is too wide.



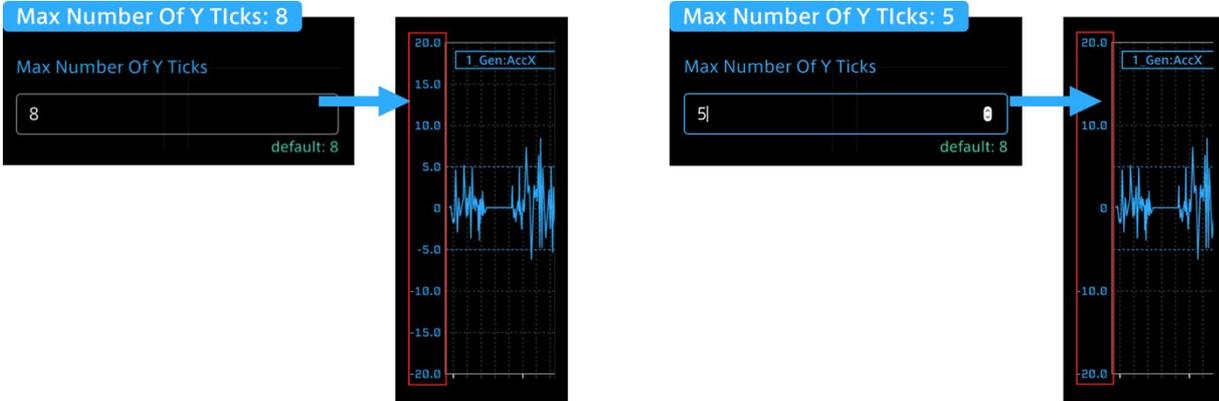
Setting item	Required/Optional	Settings
Threshold	Optional	ON: The threshold grid set for data is displayed.



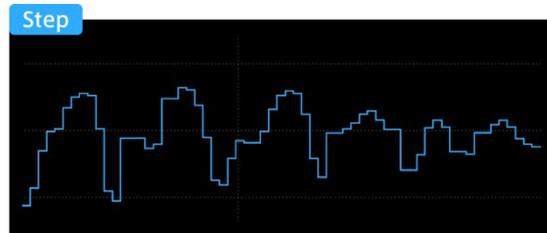
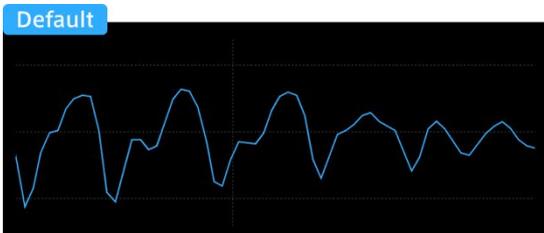
Setting item	Required/Optional	Settings
Time (X) Interval (sec)	Optional	Set the interval for the horizontal axis.



Setting item	Required/Optional	Settings
Max Number of Y Ticks	Optional	Maximum number of scales on the vertical axis. The default value is 8.



Setting item	Required/Optional	Settings
Graph Interpolation	Optional	Set the data interpolation method. Default: Line graph Step: Stepped graph



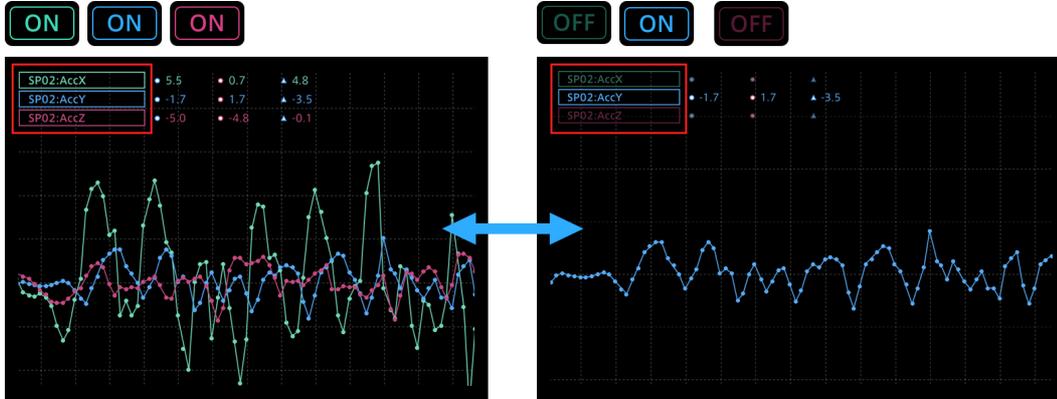
Setting item	Required/Optional	Settings
Graph Scale	Optional	Set the display scale of the graph. Absolute: Absolute value display. All data items are displayed on the same scale. Relative: Relative display. The Y axis for each data item is displayed, and the graph is drawn using its own scale.



## Showing or hiding data

When multiple data items are bound, the line graphs are displayed for all the data items. You can show or hide line graphs by clicking Field Name of each data item.

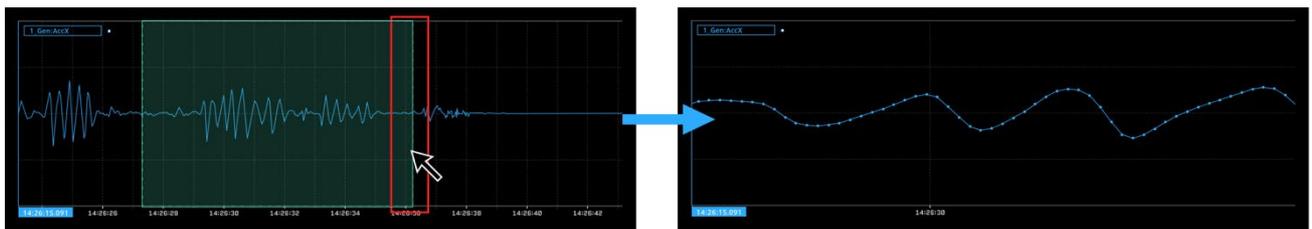
The Field Name for a hidden data item is faded out.



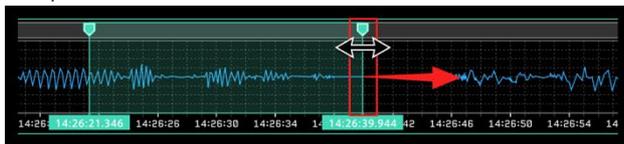
## Narrowing the display range of Line Graph

### 1. Operation on the graph

Click anywhere in the graph display area, and then drag it to the right or left.



### 2. Operation on the timeline



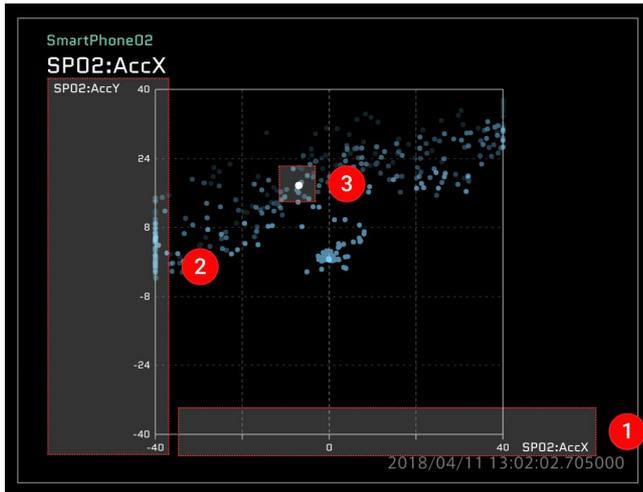
To return to the whole graph display, cancel the range specification by using the  button in the menu displayed in the upper right when hovering the mouse over the green cursor (timeline).

For details, see "[Specifying the timeline range](#)".

## Scatter

Scatter displays a scatter plot. Bind two data items to one scatter plot.

If you specify the display range by dragging on the timeline, the scatter plot is displayed only with the data in the specified range. For details about specification of the timeline range, see "[Specifying the timeline range](#)".



### Description of the window

- 1 Data01 is displayed as the X axis.
- 2 Data02 is displayed as the Y axis.
- 3 The instantaneous value is displayed.

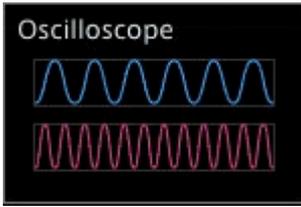
### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	Enter the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display. Two data items are always necessary.
Rendering Speed	Required	The default is 10 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

Setting item	Required/Optional	Settings
Data Range - X Axis	Optional	Set the maximum and minimum values that can be displayed on the X axis (Data01).
Data Range - Y Axis	Optional	Set the maximum and minimum values that can be displayed on the Y axis (Data02).

## Oscilloscope



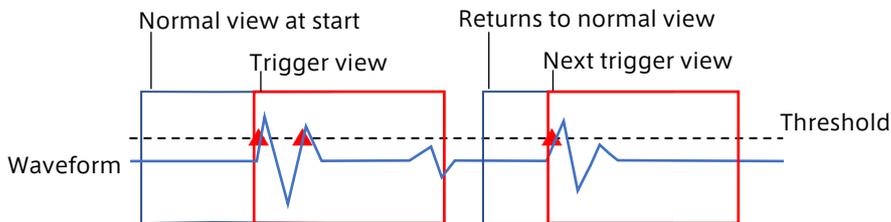
The Oscilloscope is a visual part for displaying repeated waveforms. When using the Line Graph visual part, the waveform of the entire measurement or selected range is displayed, whereas in Oscilloscope, the waveform of the specified short time range (Time Window) is cut out and displayed. As time passes, the display will be updated with the waveform of the new data.

In Oscilloscope, "trigger view" is possible by setting thresholds on the Data Settings screen, which makes it possible to display the waveform in an easy-to-see format. A trigger occurs when the value is greater than the upper threshold or less than the lower threshold. When a trigger occurs, the waveform drawing area is updated from the left end. The waveform display in such case is called trigger view.

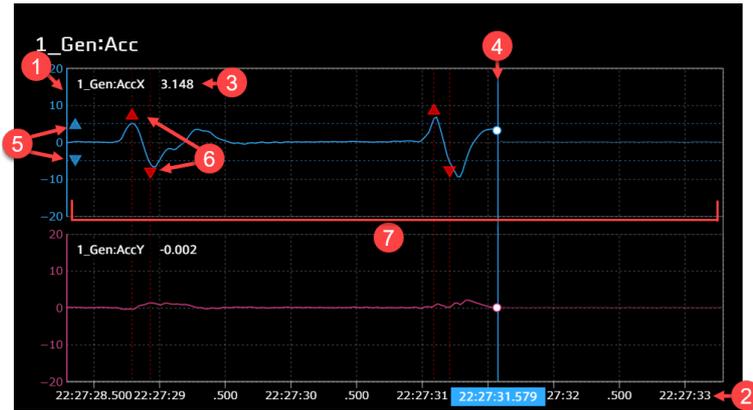
When a threshold is not set:



When a threshold is set:



### Description of the window



\* Up to 8 data can be bound.

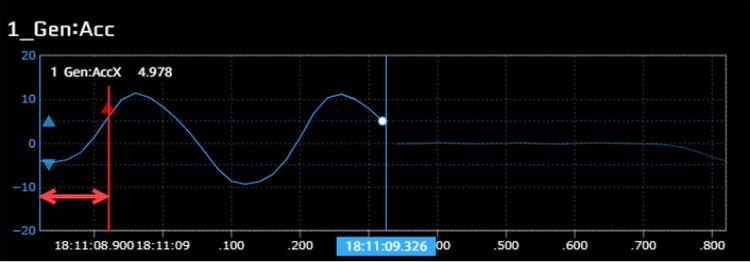
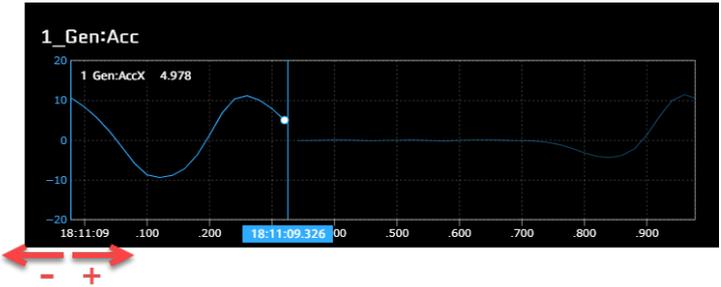
- 1 Vertical axis. The range to be displayed can be set with the [Data Range] item in the Panel Option window.
- 2 Horizontal axis representing time. The displayed time range can be set in the [Time Window] of the Panel Option window.
- 3 Data name and current value.
- 4 Current position.
- 5 Thresholds used as triggers ( Threshold set in Data Settings).
- 6 A trigger marker ( ▲ ▼ ) indicating that the value exceeds the threshold, and a trigger has occurred. Hover your mouse over the trigger marker to see when the trigger occurred.
- 7 Waveform drawing area.

### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	Set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

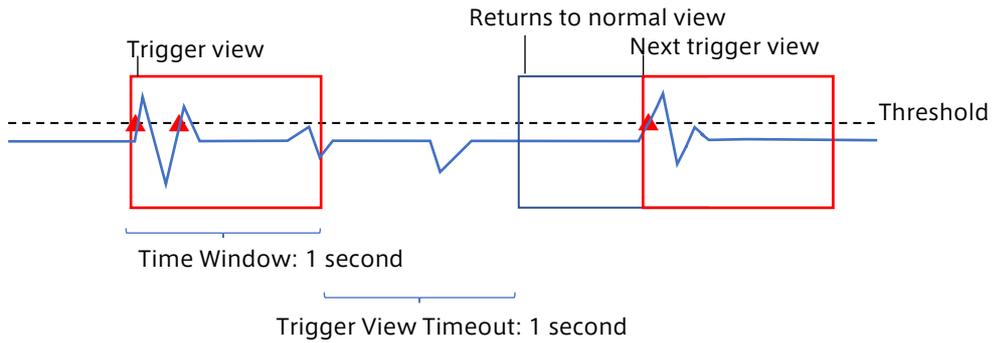
Setting item	Required/Optional	Settings
Data Range	Optional	Set the maximum and minimum values on the vertical axis.
Time Window (sec)	Optional	Set the length of the time range displayed on the horizontal axis.

<p>Trigger Position (%)</p>	<p>Optional</p>	<p>Set the position where the trigger is displayed in the waveform drawing area.</p> <p>For example, if the Trigger Position is 10%, the trigger will be displayed 10% from the left end of the waveform drawing area.</p> 
<p>Trigger View Timeout (sec)</p>	<p>Optional</p>	<p>When a trigger occurs, the Oscilloscope switches to the trigger view, but after a certain period of time, it returns to the normal view. Trigger View Timeout sets the time until the waveform returns to the normal view after it reaches the right edge in the trigger view.</p> <p>For example, if Trigger View Timeout is set to 1 second, the current trigger view will be maintained for 1 second after the waveform reaches the right edge. After that, it returns to the normal view.</p>
<p>Trigger Holdoff (sec)</p>	<p>Optional</p>	<p>Set the minimum time from one trigger to the next. No trigger will occur within this time.</p>
<p>Time Offset (sec)</p>	<p>Optional</p>	<p>Shifts the display time range. For example, setting the Time Offset to -0.2 shifts the display time range 0.2 seconds to the left.</p> <p>This setting is valid only for the normal view. Use Trigger Position to shift the time range in the trigger view.</p> 

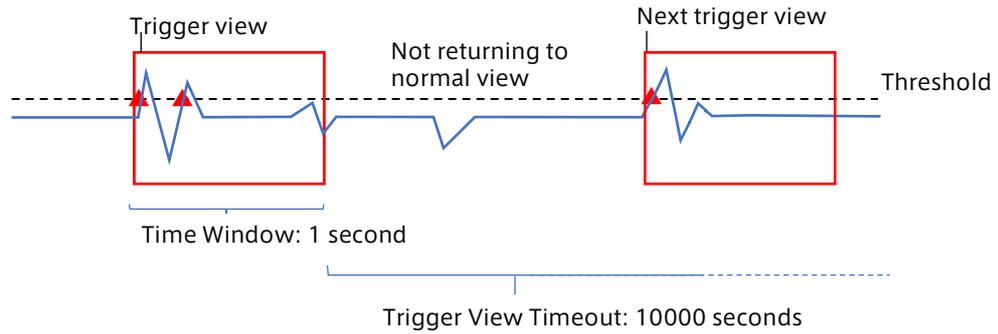
**Point: Update the display only when the threshold is exceeded**

The trigger view automatically returns to the normal view after the time set by Trigger View Timeout has elapsed. If you do not need to return to the normal view and want to check only the waveform when the trigger occurs, set a large value (for example, 10000 seconds) for Trigger View Timeout. This allows you to postpone the timing of returning to normal view so that the display does not update until a trigger occurs.

Example when Trigger View Timeout is set to a small value:



Example when Trigger View Timeout is set to a large value  
(Updates the display only when the threshold is exceeded):

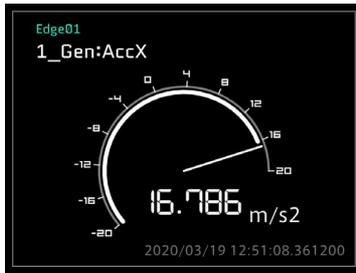


## 16.4 Meter

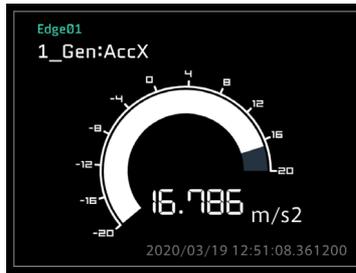
### Various basic meters

The following types of meters display one piece of bound data. Of these meters, Bar Meter and Zero Based Meter display the midpoint between minimum and maximum values (as set in Panel Option) at the center as the reference point. Zero Based Meter shows the difference from the reference point with a bar.

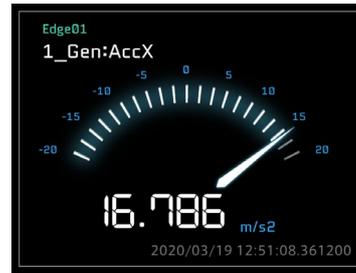
Arc Instrument



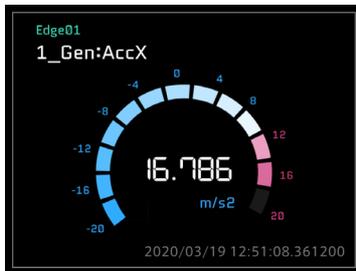
Arc Meter



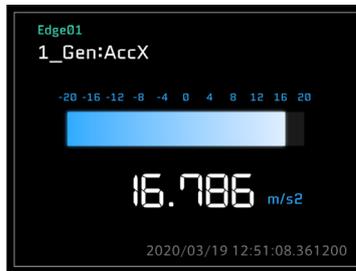
Arc Instrument001



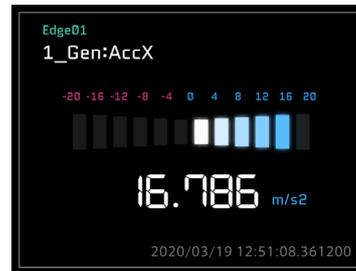
Arc Subdivision Meter



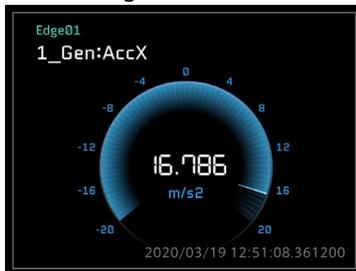
Bar Meter



Zero Based Meter



Radial Gauge Meter



### Panel Settings

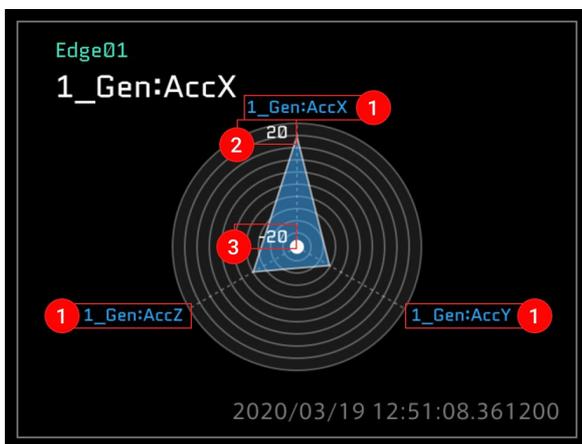
Setting item	Required/Optional	Settings
Panel Name	Optional	Set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

Setting item	Required/Optional	Settings
Data Range - Axis	Optional	Set the maximum and minimum values of the meter.
Ticks	Optional	Set the number of ticks of the meter.

### Radar Chart

Radar Chart displays multiple data items on a radar chart. Up to 10 data items can be bound to one radar chart.



#### Description of the window

- 1 The set data name is displayed.
- 2 The max Data Range of Data01 is displayed (this can be changed with Data Range of Panel Option).
- 3 The min Data Range of Data01 is displayed (this can be changed with Data Range of Panel Option).

#### Point: Maximum and minimum values of a radar chart

The maximum and minimum values of a radar chart can be set only for Data01.

### Panel Settings

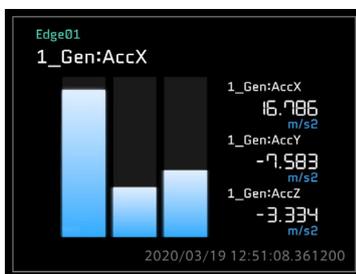
Setting item	Required/Optional	Settings
Panel Name	Optional	Set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

Setting item	Required/Optional	Settings
Data Range - Axis	Optional	Set the maximum and minimum values of a radar chart.
Ticks	Optional	Set the number of scales of a radar chart.

### Vertical Bar Meter

Vertical Bar Meter displays multiple data items in a bar graph. Up to 3 data items can be bound to one Vertical Bar Meter panel. You can set a different Data Range for each data.



### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

Setting item	Required/Optional	Settings
Data Range - 1	Optional	Set the maximum and minimum values of the display of Data01.
Data Range - 2	Optional	Set the maximum and minimum values of the display of Data02.
Data Range - 3	Optional	Set the maximum and minimum values of the display of Data03.

## 16.5 Label

Label displays numeric values and character strings. Bind one data item to one Label panel.



Visual parts	Function
Value Current	Displays the current value.
Value Average	Displays the average value in the loaded data. If you specify a range on the timeline, the average value in that range is displayed.
Value Min	Displays the minimum value in the loaded data. If you specify a range on the timeline, the minimum value in that range is displayed.
Value Max	Displays the maximum value in the loaded data. If you specify a range on the timeline, the maximum value in that range is displayed.
Hex Label	Displays the current value in hex format.
Binary Label	Displays the current value in binary format.
Text Label	Displays the current value in text format.

### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

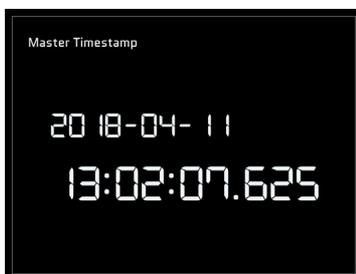
### Panel Option (only for Hex Label, Binary Label)

Setting item	Required/Optional	Settings
Data Range	Optional	Set the maximum and minimum values to be displayed.
Byte Range	Required	Set a value between 0 and 4.

## 16.6 Master

### Master Timestamp

The master timestamp, which is the reference date and time for the timeline control, is displayed.



### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	-	You do not need to set Bind Data.
Rendering Speed	Required	The default is 30 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

There is no item to set.

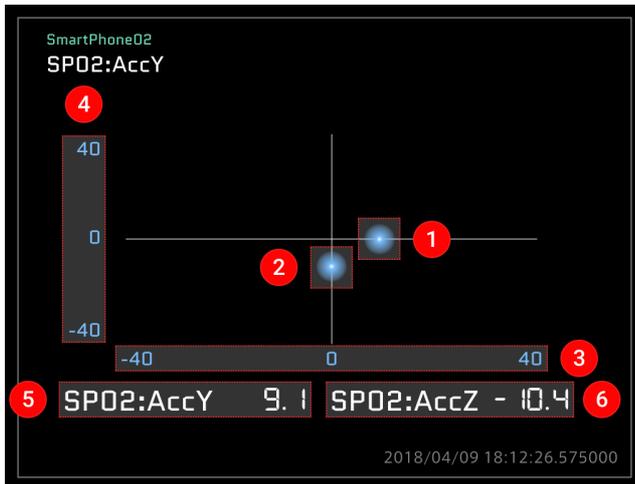
## 16.7 Position

There are six types of visual parts contained in the Position category.

### Shine Ball

Shine Ball displays data on a two-dimensional (x axis and Y axis) plane. Bind two data items to one Shine Ball panel.

#### Description of the window



- 1 The instantaneous value of Data01 is displayed as a sphere.
- 2 The instantaneous value of Data02 is displayed as a sphere.
- 3 The Data Range set in Data01 is displayed (X axis)
- 4 The Data Range set in Data02 is displayed (Y axis).
- 5 The instantaneous value of Data01 is displayed.
- 6 The instantaneous value of Data02 is displayed.

#### Panel Settings

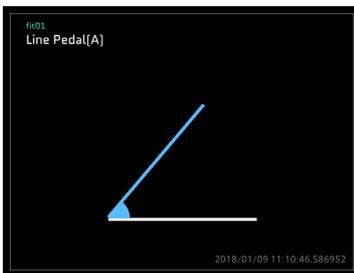
Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

Setting item	Required/Optional	Settings
Data Range - X Axis	Optional	Set the maximum and minimum values that can be displayed on the X axis (Data01).
Data Range - Y Axis	Optional	Set the maximum and minimum values that can be displayed on the Y axis (Data02).

### LINE Pedal (A), (B)

LINE Pedal displays a graphic whose angle varies resembling a pedal. Bind one data item to one LINE Pedal panel.



### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	Set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

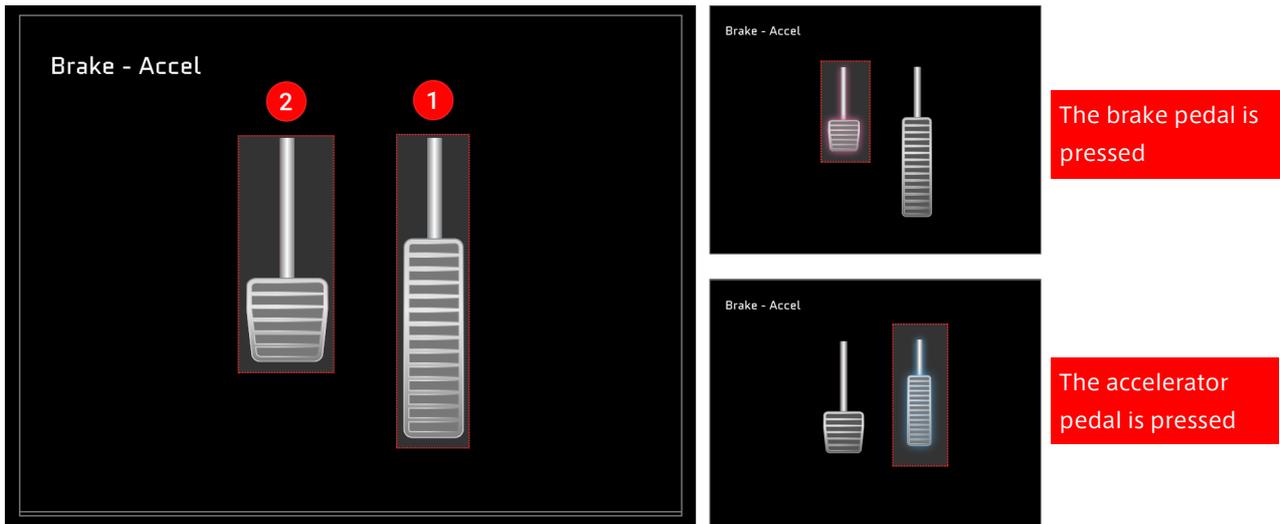
### Panel Option

Setting item	Required/Optional	Settings
Data Range	Optional	Set the maximum and minimum values to be displayed.

### Accel Brake Pedal

Accel Brake Pedal displays graphics resembling the vehicle accelerator pedal and brake pedal. Bind two data items for accelerator and brake to one Accel Brake Pedal panel.

### Description of the window



- 1 The data set in Data01 is displayed as a pedal image.
- 2 The data set in Data02 is displayed as a pedal image.

#### Point: Setting accelerator and brake

Set the accelerator data for Data01. Set the brake data for Data02.  
If Data01 and Data02 are set reversely, the accelerator operation and the brake operation are reversed.

### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	Set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display. Set the accelerator data for Data01 and the brake data for Data02.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

Setting item	Required/Optional	Settings
Data Range - Brake	Optional	Set the maximum and minimum values.
Data Range - Accel	Optional	Set the maximum and minimum values.

## AT Gear

AT Gear displays a graphic resembling the shift indicator of an automatic transmission. Bind one data item to the AT Gear panel.



### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

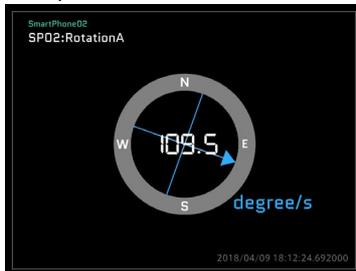
There is no item to set.

## 16.8 Rotation

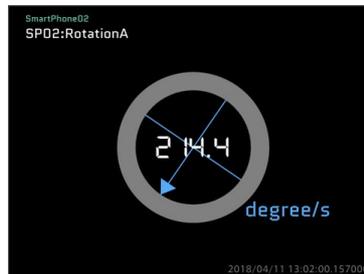
There are four types of visual parts contained in the Rotation category.

### Compass and Rotation

#### Compass



#### Rotation



Compass and Rotation display the direction. Bind one data item to the panel to display Compass or Rotation. The direction (N, E, W, S) is shown in Compass, but not in Rotation.

### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

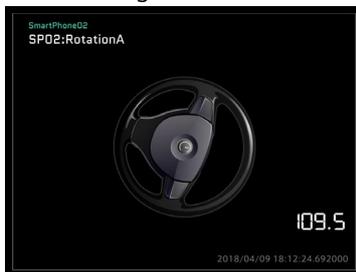
### Panel Option

There is no item to set.

### Real Steering and LINE Steering

Real Steering and LINE Steering display graphics resembling the steering wheel of a vehicle. Bind one data item to the panel that displays Real Steering or LINE Steering.

Real Steering



LINE Steering



### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

### Panel Option

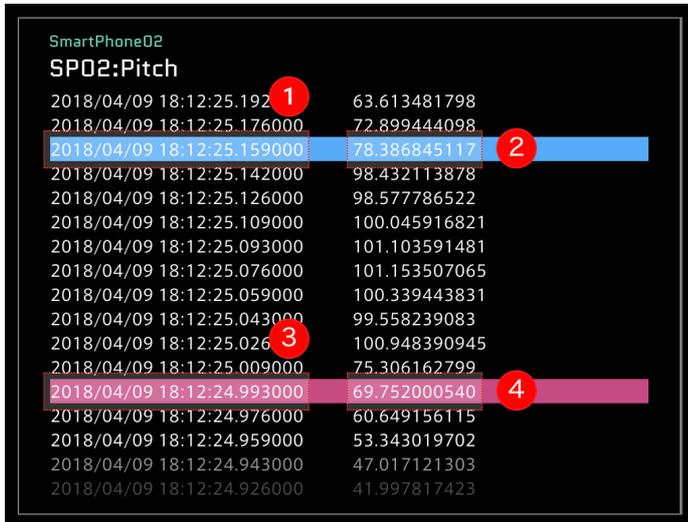
There is no item to set.

## 16.9 Stream

There is only one type of visual part contained in the Stream category.

### Text Stream

Text Stream displays the timestamps and values of data in a list format. Bind one data item to the Text Stream panel. The list of data items is displayed in descending order of timestamps.



### Description of the window

- 1 The timestamp of Current Position is displayed (instantaneous value).
- 2 The value of Current Position is displayed (instantaneous value)
- 3 The timestamp of Compared Position (comparison position) is displayed.
- 4 The value of Compared Position (comparison position) is displayed.

#### Point: Display of Compared Position

The Compared Position is displayed in red even if Show Compared Position in Timeline Settings is set to OFF.

### Panel Settings

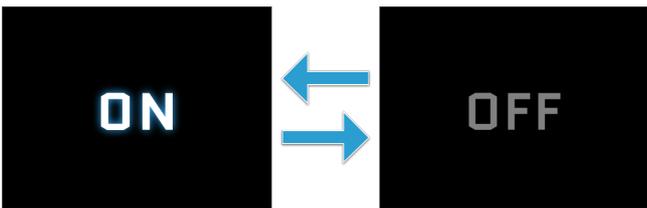
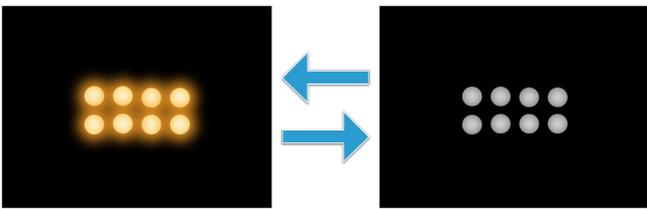
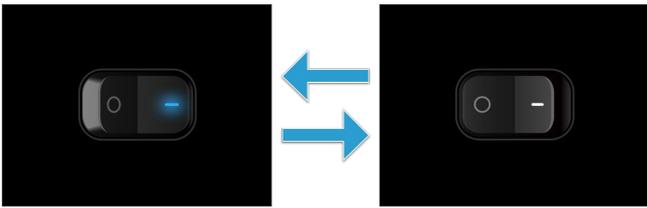
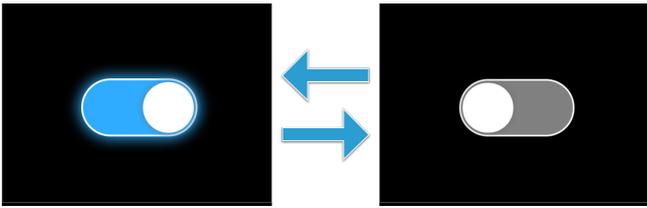
Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

## Panel Option

There is no item to set.

### 16.10 Switch

There are four types of visual parts contained in the Switch category. The value of one piece of bound data is displayed as ON (0) or OFF (1).

Part name	Image	Characteristic
Label Switch		The setting is displayed as "ON" or "OFF".
Signal Switch		The ON/OFF setting is displayed with a glowing lamp image.
Rocker Switch		The ON/OFF setting is displayed with a rocker switch (seesaw switch) image.
Slide Switch		The ON/OFF setting is displayed with a slide switch image.

## Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

## Panel Option

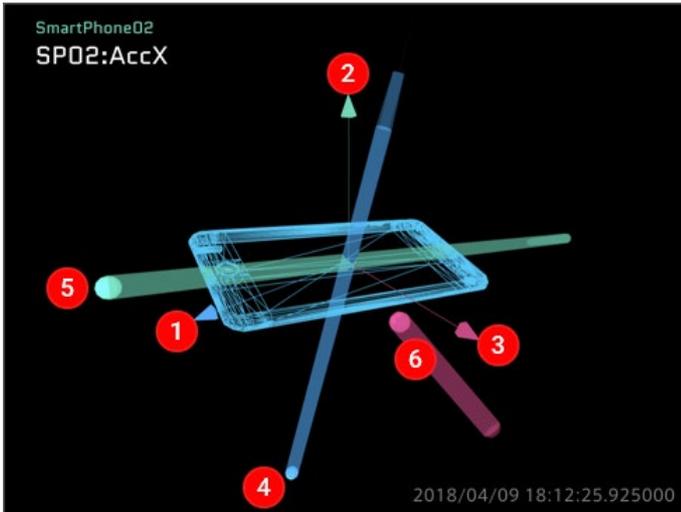
There is no item to set.

## 16.11 3D

### SmartPhone

The attitude and acceleration are displayed with a smartphone graphic.

#### Description of the window



- 1 Displays the X axis.
- 2 Displays the Y axis.
- 3 Displays the Z axis.
- 4 Displays the X acceleration.
- 5 Displays the Y acceleration.
- 6 Displays the Z acceleration.

#### Panel Settings

Setting item	Required/Optional	Settings
Panel Name	Optional	You can set the name to be displayed on the panel.
Bind Data	Required	Select the device where the data is collected (edge) and the data you want to display.
Rendering Speed	Required	The default is 20 fps. Decreasing the rendering speed will decrease the frequency of data updates and decrease the processing load. Increasing the rendering speed will increase the frequency of data updates and increase the processing load.

**Panel Option**

Setting item	Required/Optional	Settings
model Rotation X	Required	Set the offset of the model X-axis rotation.
model Rotation Y	Required	Set the offset of the model Y-axis rotation.
model Rotation Z	Required	Set the offset of the model Z-axis rotation.
local Rotation X	Required	Set the offset of the local X-axis rotation.
local Rotation Y	Required	Set the offset of the local Y-axis rotation.
local Rotation Z	Required	Set the offset of the local Z-axis rotation.
orientation Angle	Required	Select [euler] or [quaternion] for the posture angle.
coordinate System	Required	Select [left handed] or [right handed] for the coordinate system.

# 17 FAQ

## 17.1 Q&A about accounts

Question	Answer
Is it possible to create user information?	User information cannot be created by Data Visualizer. Use the Edge Admin Console application.
Is it possible to edit or delete user information?	User information cannot be edited or deleted by Data Visualizer. Use the Edge Admin Console application.
How can I sign out?	Open [User Settings], and then select [Sign out].
What should I do if I forget my login password?	Click [Forgot Password?] in the login window, and then reissue a password.

## 17.2 Q&A about data settings

Question	Answer
What is a parse data file?	Data Visualizer treats measurement data as binary data. A parse data file contains definition information (parse data) for displaying measurement data as physical values.
How can I add settings from a parse data file?	Select [Import] from the Data Settings menu, and then select the file you want to add.
How can I add/delete data to/from the registered parse data?	From the Data Settings menu, select [Add Group] to add a group, or [Delete Group] to delete a group. If you want to add only data, select [Add Data]. If you want to delete only data, select [Edit], and then [Delete].

## 17.3 Q&A about screen settings

Question	Answer
What is a screen?	In Data Visualizer, a screen is a specific configuration for the display of measurement data.
How do I save a screen?	Screens are saved automatically. The same screen information can be used in another PC environment by executing [Export].

## 17.4 Q&A about visual parts

Question	Answer
What are the Visual Parts?	Visual parts provide a graphical representation of measurement data. You can use Visual Parts by arranging them on screens. Visual Parts have various shapes such as graphs, movies, and meters, which provide the most suitable visualization for the characteristics and purposes of the data.
How can I arrange Visual Parts on the screen?	Select the part you want to display from [Visual Parts] at the bottom of the window, and then drag and drop the part to the target screen.

## 17.5 Q&A about playback

Question	Answer
How can I perform live playback?	Select [LIVE]. Then, select [Play].
How can I replay Stored Data?	From [Stored Data], select the data you want to replay. Then, select [Play].
How can I switch from in-progress live playback to Stored Data playback?	Select [LIVE]. The [Stored Data] window appears. Then, select the data you want to replay.
How can I switch from in-progress Stored Data playback to live playback?	Select [LIVE]. Then, select [Play].
Is it possible to change the playback speed?	You can adjust the playback speed by selecting the playback speed from the [Speed] list.
Is it possible to replay only the data within a particular range?	Click [Preview Stored Data] in Capture to replay data within a set range. Also, when clicking [Create a Capture] and naming the specified range, a capture is created in Stored Data.
How can I display a graph on the timeline?	Set the data from the [Timeline Settings] menu.
What is the capture?	A capture is obtained by executing [Create a Capture] to extract a specific time range in the data. Think of it as a bookmark with a specified time range.
Is there a limit on the playable time?	The playable time differs depending on the environment. For more information, contact your aptpod representative.
How can I download time-series data?	You can download data from the [Data Download] menu.

## 17.6 Q&A about various settings

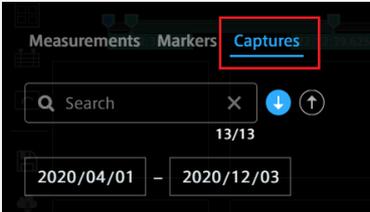
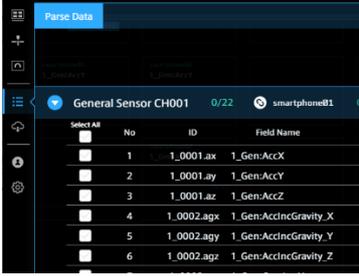
Question	Answer
How can I delete a panel that has been set?	Select the panel you want to delete, and then select [Delete Panel].
Is it possible to change the size of a panel?	You can change the size by dragging the "●" points (9 places) displayed on the frame when you mouse over the panel.
Is it possible to display visual parts in full screen?	You can enlarge visual parts and cancel them by clicking the button at the bottom of the panel. In addition, you can display specific parts such as videos and maps on the entire background of the window by clicking the full screen button.
Is it possible to switch the display to full screen?	Click the full-screen display icon in the upper left of the window. To return the display to the original size, click the full-screen display icon again.
Is it possible to copy the visual part panel being displayed?	Drag and drop the panel you want to copy while holding down the [Alt] key.

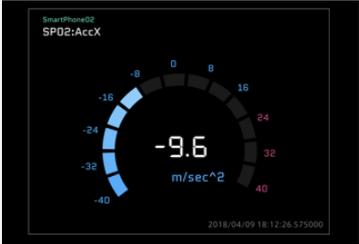
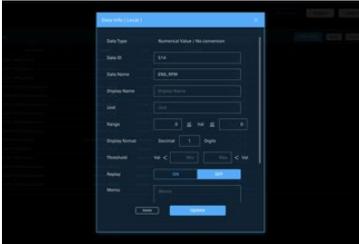
## 17.7 Other Q&A

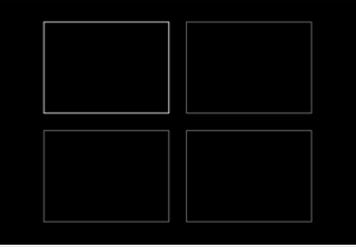
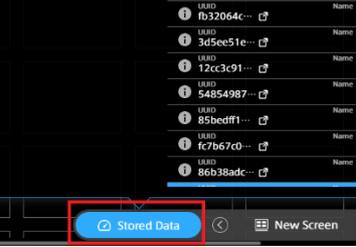
Question	Answer
What is the load information?	Load on the browser differs depending on the panel settings. In the load information window, the number and types of visual parts being set and high-load visual parts are displayed. You can copy the information by clicking [Copy]. Additionally, the load status of the browser is indicated by the color of the icon.
Is it possible to switch the display language?	The display language of Data Visualizer is English only.
Which environment is guaranteed to provide correct operation?	Operation on the Chrome browser is guaranteed for both Windows and Mac.
What should I do if the version upgrade is not applied?	Perform a super reload. Super reload ignores browser cache and forcibly downloads a file from the Web server.

# 18 Glossary

## 18.1 Terms related to Data Visualizer

Term	Description
<p><b>Bind data</b></p> 	<p>Data to be set in the panel.</p>
<p><b>Capture</b></p> 	<p>Data that is extracted for a particular time range. Data can be extracted down to 0.001 seconds.</p>
<p><b>DAT</b></p> 	<p>A data file or format for storing parse data.</p>
<p><b>Data bind (data binding)</b></p> 	<p>Data binding is to set data in a panel. You can visually display the measurement data in the optimal form by binding the data that matches the visual parts.</p>
<p><b>Edge</b></p> 	<p>An edge is a node which sends or receives data.</p>

<p><b>Live Duration Time</b></p>	<p>The length of the timeline displayed during real-time playback.</p>
<p><b>Master timestamp</b></p> 	<p>A visual part that displays the reference time for playback. The current time is displayed for real-time measurement, and the measurement time of the playback target is displayed for Stored Data playback.</p>
<p><b>Panel</b></p> 	<p>An area where visual parts are displayed. You can set visual parts individually, display frames for them, and change their display size.</p>
<p><b>Parse data</b></p> 	<p>Definition for converting binary data into numeric values or character strings.</p>
<p><b>Rendering speed</b></p> 	<p>The number of times to render a part in one second.</p>
<p><b>Screen</b></p> 	<p>Panel configuration setting. You can save frequently-used screens, import/export them as files, and download templates.</p>

<p><b>Screen panel</b></p> 	<p>An area where panels are displayed.</p>
<p><b>Stored Data</b></p> 	<p>Past measurement data or past data that is arbitrarily extracted.</p>
<p><b>Timestamp</b></p> 	<p>Time information.</p>
<p><b>Visual Parts</b></p> 	<p>Visual parts provide a graphical representation of measurement data. Data can be displayed in various data-specific visual parts, such as graph format, meter format, and video format.</p>

## 18.2 General terms

Term	Description
<b>Binary Data</b>	Data expressed in binary format.
<b>Cache</b>	A mechanism to temporarily store already used data in an area with a high reading speed so that it can be reused.
<b>CAN</b>	The abbreviation for Controller Area Network, which is a serial bus for networks. This is the standard for in-vehicle networks.
<b>DBC</b>	This is the industry-standard conversion definition format (developed by Vector Inc.) for CAN bus definition files.
<b>FPS</b>	This term represents the number of frames per second.
<b>HEX value</b>	Data expressed in hexadecimal format.
<b>Histogram</b>	A type of statistics graph for visually recognizing data.
<b>Range</b>	The range of data to be set in the panel. For example, you can specify a desired speed range to be displayed (such as "0 km/h to 90 km/h").
<b>RPM</b>	A unit that indicates the number of times periodic phenomenon (such as rotation) is repeated.
<b>Stream</b>	This is to successively transmit and receive data or perform data processing.
<b>Threshold</b>	Threshold of data. You can change the color of the panel when the value exceeds or falls below the specified value, or goes out of range.

## 19 Support

If you have any questions or problems, please contact us by using the following contact information.

### Email address (customer support)

[VM2M-support@aptpod.co.jp](mailto:VM2M-support@aptpod.co.jp)

### Website

aptpod, Inc.

<https://www.aptpod.co.jp/en/>